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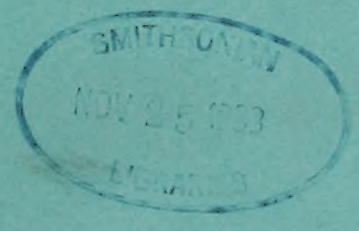
Calman, W. T.

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from the collection of the Copenhagen Museum.

Pt. I.

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From the TRANSACTIONS OF THE ZOOLOGICAL SOCIETY, vol. xviii.—part 1, August 1907.

- I. On New or Rare Crustacea of the Order Cumacea from the Collection of the Copenhagen Museum.—Part I. *The Families Bodotriidæ, Vauntomponiidæ, and Leuconidæ.* By W. T. CALMAN, D.Sc., F.Z.S., British Museum (Natural History).
William Thomson

(Received December 5, 1906; read February 5, 1907.)

[PLATES I.—IX.]

THIS paper deals with a part of a rich collection of Cumacea belonging to the Zoological Museum of Copenhagen, and entrusted to me for examination by the kindness of Dr. F. Meinert and Dr. H. J. Hansen. It also includes a description of some specimens sent to me from New Zealand by Mr. G. M. Thomson, which throw light on species represented in the Copenhagen Collection.

Altogether 30 species are dealt with, and of these 25 are regarded as new. The majority of the species are derived from collections made in New Zealand and the Gulf of Siam by Mr. H. Suter and Dr. Th. Mortensen respectively. There is no ground for supposing that these localities are unusually prolific in Cumacea, and the rich collections obtained there simply help to indicate how much remains to be done by competent collectors in investigating the micro-crustacean fauna of shallow water in tropical and southern seas.

Among the more interesting of the forms described below attention may be called to the remarkable new species for which I have established the genus *Zygosiphon*; to the very aberrant forms of Leuconidæ comprised in the new genera *Heteroleucon*,

Paraleucon, and *Hemileucon*, and to the long series of new species referred to the genus *Cyclaspis*. The re-discovery of Sars's *Leptocuma kingbergii* is also of interest, but the solitary specimen, though of relatively gigantic size, has not enabled me to add much to our knowledge of the species.

By the courtesy of the authorities of the Copenhagen Museum, a selection of the specimens here described has been retained for the British Museum.

List of the Species dealt with in this Paper.

Family BODOTRIIDÆ.

<i>Bodotria sublevis</i> , sp. n.	Gulf of Siam.
„ <i>similis</i> , sp. n.	„
„ <i>siamensis</i> , sp. n.	„
„ <i>parva</i> , sp. n.	„
<i>Cyclaspis longipes</i> , sp. n.	West Indies.
„ <i>levis</i> G. M. Thomson.	New Zealand.
„ <i>elegans</i> , sp. n.	„
„ <i>similis</i> , sp. n.	„
„ <i>uniplicata</i> , sp. n.	Gulf of Siam.
„ <i>unicornis</i> , sp. n.	West Indies.
„ <i>cingulata</i> , sp. n.	Gulf of Siam.
„ <i>thomsoni</i> , sp. n.	New Zealand.
„ <i>biplicata</i> , sp. n.	„
„ <i>triplicata</i> , sp. n.	„
<i>Eocuma longicornis</i> , sp. n.	Suez.
„ <i>lata</i> , sp. n.	Gulf of Siam.
„ <i>stellifera</i> , sp. n.	„
„ <i>producta</i> , sp. n.	Penang.
<i>Zygosiphon mortenseni</i> , gen. et sp. n.	Gulf of Siam.
<i>Iphinoë</i> sp.	„

Family VAUNTOMPSONIIDÆ.

<i>Vauntomponia cristata</i> Spence Bate.	West Indies.
„ <i>arabica</i> , sp. n.	Suez Canal, Aden.
<i>Leptocuma kingbergii</i> G. O. Sars.	Straits of Magellan.

Family LEUCONIDÆ.

<i>Leucon</i> (?) <i>heterostylis</i> , sp. n.	New Zealand.
<i>Eudorella truncatula</i> (Spence Bate).	„
<i>Eudorellopsis resimus</i> , sp. n.	„
<i>Heteroleucon akaroënsis</i> , gen. et sp. n.	„
<i>Paraleucon suteri</i> , gen. et sp. n.	„
<i>Hemileucon uniplicatus</i> , gen. et sp. n.	„
„ <i>comes</i> , sp. n.	„

Family BODOTRIIDÆ.

Genus BODOTRIA.

As I have elsewhere pointed out (Cumacea of Siboga Exped. p. 5), this genus is distinguished from *Cyclaspis* by very slight characters, of which the chief is the possession of a longitudinal lateral ridge on the carapace, and even this becomes inconspicuous in some of the new species described below.

Key to the Species of Bodotria.

- A. Endopod of uropods composed of two segments.
 - a. A single lateral ridge on carapace.
 - a. Lateral ridge well-marked, extending on to free thoracic somites.
 - a'. Thoracic somites keeled dorsally *B. scorpioides* (Mont.).
 - b'. Thoracic somites produced dorsally into laminar crests . . . *B. gibba* (Sars).
 - b. Lateral ridge faintly marked on carapace, not developed on thoracic somites *B. sublevis*, sp. n.
 - b. Two distinct lateral ridges on carapace *B. pulchella* (Sars).
- B. Endopod of uropods unsegmented.
 - a. Lateral ridge well-marked, extending on to thoracic somites.
 - a. Basis of first leg (in female) $1\frac{1}{2}$ times as long as distal segments. *B. arenosa* Goodsir.
 - b. Basis of first leg (in female) shorter than distal segments . . . *B. similis*, sp. n.
 - b. Lateral ridge faintly marked on carapace, not developed on thoracic somites.
 - a. Antennal tooth of carapace acute *B. siamensis*, sp. n.
 - b. Antennal tooth of carapace rounded *B. parva*, sp. n.

B. pulex Zimmer has been omitted from the key as I have seen no specimens. It has the endopod of the uropods unsegmented, and the lateral ridge faintly marked on the carapace but well-developed on the free thoracic somites.

In the collection of the Rev. Canon Norman I have examined four specimens labelled "*Cuma folinii* Fischer" from the Bay of Biscay. I have been unable to discover whether any description of this species has been published. It is closely allied to *B. arenosa*, of which, perhaps, it may be only a variety.

BODOTRIA SUBLEVIS, sp. n. (Plate I. figs. 1-3.)

Description of adult Female.—Total length 2.6 mm.

The carapace is a little more than two-sevenths of the total length. The dorsal edge, seen from the side, is nearly straight, with a slight notch at about one-third of the length from the hind margin. The pseudorostrum is nearly horizontal. The dorsal keel is distinct but not prominent on the carapace and thoracic somites. On

the carapace the lateral keel is distinct only in its middle portion, and its posterior end curves slightly upwards; it is not developed on the first free somite, and only a slight lateral elevation indicates its place on the posterior thoracic somites; below it on the carapace is a slightly marked elevation, not forming a distinct keel, and behind the above-mentioned notch on the dorsal surface is a slight transverse elevation, not sharply defined. Antennal tooth triangular. Basis of first legs a little shorter than the remaining segments together. Uropods longer than the last two somites together, the rami two-thirds as long as the peduncle. Endopod of two segments, the proximal nearly four times as long as the distal, with five spines on its inner edge; distal segment with two spines.

Immature Male.—Total length 2.6 mm.

Resembling the female, except that the carapace is still smoother, the lateral keel being the only one distinct.

Occurrence.—Gulf of Siam, "Koh Kam, 5 fathoms, 6/2/00." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

BODOTRIA SIMILIS, sp. n. (Plate I. figs. 4–9.)

Description of adult Female.—Total length 2.15 mm.

Closely resembling in general characters *B. arenosa* Goodsir. Carapace less than two-sevenths of total length. Median dorsal keel rather prominent on the thoracic somites. Lateral keel well-marked and straight on carapace and on all except the last of the free thoracic somites. No distinct ridge below lateral keel on side of carapace. Antennal tooth triangular. Basis of first legs a little shorter than the remaining segments together. Uropods longer than the last two somites together, the exopod about three-fourths as long as the peduncle and a little longer than the endopod. Endopod unsegmented, with six small spines on the distal part of its inner edge, the last close to the slender terminal spine. Exopod with two unequal slender terminal spines and a series of setæ on the inner edge.

Adult Male.—Total length 2.8 mm.

There is a distinct ridge on the side of the carapace below the lateral keel. The latter is distinct on all the free thoracic somites. Basis of first legs a little longer than the remaining segments together. Rami of uropods subequal and two-thirds as long as the peduncle. Endopod with twelve spines on the inner edge.

Remarks.—This species resembles very closely the *B. arenosa* of British and Norwegian Seas. It is distinguished by its very much smaller size, by the shorter basis of the first legs, and by the longer rami of the uropods.

Occurrence.—Gulf of Siam, "Between Koh Mesan and Cape Liant" and "Tung Kaben." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

BODOTRIA SIAMENSIS, sp. n. (Plate I. figs. 10-15.)

Description of adult Female.—Total length 2.1 mm.

Carapace about one-fourth of total length. Median dorsal keel not very prominent on carapace or on thoracic somites. Lateral keel rather faintly marked on anterior part of carapace, becoming obsolete posteriorly; not continued on to the thoracic somites. Antennal tooth narrow and acute, almost spiniform. Basis of first legs about four-fifths as long as the remaining segments together. Uropods about one-fifth longer than the last two somites together, the rami sub-equal and five-sixths as long as the peduncle. Endopod unsegmented, with nine spines on distal part of its inner edge, increasing in size distally; terminal spine slender. Exopod with three unequal terminal spines and a series of setæ on the inner edge.

A transverse band of dark pigment occupies the region of the first leg-bearing somite.

Adult Male.—Total length 2.75 mm.

Carapace less than one-fourth of total length. Rami of uropods about three-fourths as long as the peduncle. Endopod with ten spines along the whole length of its inner edge, increasing in size distally.

Remarks.—This species resembles in many ways *B. similis*, in company with which it was found; but it is distinguished from that species by the lateral keel being inconspicuous on the carapace, and absent altogether from the thoracic somites.

Occurrence.—Gulf of Siam, "Between Koh Mesan and Cape Liant, 5-8 fathoms"; "Koh Kam, 5-10 fathoms." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

BODOTRIA PARVA, sp. n. (Plate I. figs. 16-18.)

Description of adult Female.—Total length 1.5 mm.

Carapace more than two-sevenths of total length. Dorsal edge with a depression bounded behind by a slight crescentic transverse ridge near its hinder end. Two faintly marked longitudinal ridges on sides of carapace, not reaching to posterior margin nor joining the above-mentioned transverse ridge. Antennal tooth bluntly rounded. No ridges on the free thoracic somites. Basis of first legs a little shorter than the remaining segments together. Uropods slightly longer than the last two segments together, the rami subequal and rather less than two-thirds the length of the peduncle. Endopod with one spine on its inner edge about the middle of its length, and another close to the apical spine, which is long and stout; the inner edge between the two spines is coarsely serrated. The exopod has two unequal terminal spines and no setæ on its inner edge.

Remarks.—In having the antennal tooth of the carapace bluntly rounded and in the armature of the uropods this minute species differs from all the other species of the

genus. It appears to resemble *B. pulchella* in the disposition of the ridges on the carapace, though these are very obscure.

Occurrence.—Gulf of Siam, "Koh Kam, 5 fathoms." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

Genus CYCLASPIS.

The new species described below form, with those already referred to this genus, a somewhat varied assemblage, within which, however, I am unable to define any groups which appear worthy of generic rank. The species of *Cyclaspis* form a very important part of the Cumacean fauna of tropical and southern seas.

Key to the Species of Cyclaspis

(excluding *C. argus* and *C. bistriata* Zimmer, of which I have seen no specimens *).

- A. No eye or ocular lobe *C. longicaudata* G. O. Sars.
- B. Eye and ocular lobe present.
 - a. Carapace quite smooth.
 - a. Peduncle of uropods more than twice as long as the rami . . . *C. picta* Calman.
 - b. Peduncle of uropods not much longer than the rami.
 - A'. Basis of first legs with a spiniform tooth at its distal end.
 - a'. First legs long, propodus twice as long as carpus . . . *C. hornelli* Calman.
 - b'. First legs short, propodus equal to carpus *C. herdmani* Calman.
 - B'. Basis of first legs without a spiniform tooth at its distal end.
 - a'. Carapace one-third of total length *C. pusilla* G. O. Sars.
 - b'. Carapace less than one-third of total length.
 - 1. First legs very long, basis about half as long as distal segments together *C. longipes*, sp. n.
 - 2. First legs short, basis nearly equal to distal segments together *C. levis* G. M. Thomson.
 - b. Carapace more or less strongly ridged or sculptured, or armed with a tooth on the dorsal crest.
 - a. Ridges enclosing a quadrilateral depressed area on each side of the carapace.
 - A'. Two strong transverse ridges crossing dorsal surface of carapace.
 - a'. Transverse ridges thickened *C. exsculpta* G. O. Sars.
 - b'. Transverse ridges not thickened, the posterior one with two hooked teeth *C. persculpta* Calman.

* Two additional species of the genus have been described by Dr. Zimmer since this paper was read (Zool. Anz. xxxi. p. 367, 1907).

- B'. No transverse ridges on dorsal surface of carapace.
- a'. A prominent tooth at the posterior lower corner of the lateral enclosed area *C. elegans*, sp. n.
- b'. No tooth at the posterior lower corner of the lateral enclosed area *C. similis*, sp. n.
- b. Ridges not enclosing a quadrilateral area on the side of the carapace.
- A'. Dorsal crest of carapace with a sharp tooth near anterior end,
1. Carapace with an oblique lateral ridge *C. uniplicata*, sp. n.
2. No ridge on carapace *C. unicornis*, sp. n.
- B'. Dorsal crest of carapace unarmed.
1. Carapace longitudinally ribbed *C. costata* Calman.
2. Carapace with a very prominent encircling ridge anteriorly *C. cingulata*, sp. n.
3. Carapace with a single short oblique ridge laterally . . . *C. thomsoni*, sp. n.
4. Carapace with two subparallel oblique ridges laterally . . *C. biplicata*, sp. n.
5. Carapace with two widely divergent oblique ridges . . . *C. australis* G. O. Sars.
6. Carapace with three transverse ridges crossing the dorsal surface and uniting below *C. sibogæ* Calman.
7. Carapace with three ridges laterally, the two posterior uniting or dying out before reaching the mid-dorsal line *C. triplicata*, sp. n.

CYCLASPIS LONGIPES, sp. n. (Plate V. figs. 1-5.)

Description of adult Female.—Total length 3.1 mm.

The carapace is about two-sevenths of the total length, slightly compressed, its vertical height less than two-thirds of its length. The dorsal edge is slightly keeled, most distinctly so in front, and is hardly at all arched as seen from the side. Pseudo-rostrum very short, the ocular lobe reaching quite to the tip. Antennal notch shallow, widely open. Antennal tooth very sharp, almost spiniform. The ocular lobe is very broad and prominent on the dorsal surface.

First leg-bearing somite well exposed. The second has a slight dorsal keel.

Abdomen a little longer than the cephalothoracic region; the somites subcylindrical, with lateral articular processes.

Antennules rather long, the last segment of the peduncle longer than the preceding.

The first legs are very long and slender, extending beyond the tip of the pseudo-rostrum by nearly two-thirds of the length of the carapace. The basis is not much more than half of the length of the distal segments together. The dactylus is shorter than the propodus and longer than the carpus.

The peduncle of the uropods is one and a half times as long as the last somite and is finely serrated on the inner edge. The endopod is about two-thirds as long as

the peduncle, with a slender apical spine and five small spines on the distal half of its inner edge. The exopod is one-fourth longer than the endopod, and has a slender apical spine with two spinules at its base and a single slender spine a little way down the inner edge.

Adult Male.—Total length 3.3 mm.

Resembling the female in general form. Carapace a little less deep. The ocular lobe is more swollen and the corneal facets are larger. The antennal tooth is not so sharp. The first leg-bearing somite just visible between the carapace and the second somite. The first legs are long and slender as in the female.

The peduncle of the uropods is of the same relative length as in the female and bears a series of plumose setæ on the inner edge. The rami are less unequal than in the female, the endopod being about five-sixths of the length of the peduncle and the exopod only a little longer. The endopod has ten spinules on its inner edge, and the exopod bears three plumose setæ internally.

Remarks.—The smoothness of the carapace and the presence of five free thoracic somites bring this species into the neighbourhood of *C. picta*, *C. herdmani*, and *C. hornelli* Calman. While resembling the last two in general shape, it differs from them in having the basal segment of the first legs not produced into a distal tooth. *C. picta* differs in the acute pseudorostrum, the more arched carapace, the shorter rami of the uropods, and in the much shorter first legs.

Occurrence.—"Cruz Bay, St. Jan [Danish West Indies]. Chr. Levinsen, 6.1.93." Two specimens. Copenhagen Museum.

CYCLASPIS LEVIS G. M. Thomson. (Plate V. figs. 6-8.)

Cyclaspis levis G. M. Thomson, Journ. Linn. Soc., Zool. xxiv. p. 264, pls. xvi. & xvii. figs. 1-26 (1892).

Description of adult Female.—Total length 7.16 mm.

The carapace is about two-sevenths of the total length, hardly compressed, its vertical height little more than half its length. The dorsal edge distinctly keeled; keel flattened or faintly doubled posteriorly, very little arched as seen from the side. Pseudorostrum very short, the ocular lobe reaching quite to the tip. Antennal notch not widely open and antennal tooth not acute. Ocular lobe slightly prominent on dorsal surface. The surface of the carapace is everywhere beset with shallow and inconspicuous pits. There is a faintly marked ridge running backwards for a short distance from the antennal tooth.

First leg-bearing somite exposed at the sides only. Second with a distinct dorsal keel.

Abdomen a little longer than the cephalothoracic region; the somites subcylindrical, with lateral articular processes, with a median dorsal and slight lateral keels.

Antennules short; the last two segments of the peduncle equal.

First legs of moderate length, extending beyond the tip of the pseudorostrum by less than one-third of the length of the carapace. The basis is hardly shorter than the distal segments together and is not produced into a tooth, but bears two densely plumose setæ at the distal end. The dactylus is a little shorter than the propodus and about equal to the carpus.

The peduncle of the uropods is equal to or very little longer than the last somite. The endopod is a little shorter than the peduncle, acutely pointed at the tip, without an apical spine, with four spinules on its inner edge. Exopod a little longer than endopod, with a small apical spine and plumose setæ on its inner edge.

Adult Male.—The single adult male in the collection is crushed and imperfect. So far as can be seen, however, it differs little from the female except in the usual secondary sexual characters. The corneal facets of the eye are larger, the antennal notch of the carapace is shallower, and the antennal tooth less prominent. The uropods have the peduncle and the endopod fringed with setæ on the inner edge, and the rami are subequal in length.

In immature specimens of both sexes, and apparently also in the adult male, the first leg-bearing somite is quite concealed.

Remarks.—This species resembles the last in having a smooth carapace, the ocular lobe reaching the tip of the pseudorostrum, and the basal segment of the first legs not produced into a distal tooth. It differs in having the first leg-bearing somite only partially exposed, the first legs much shorter, and the peduncle of the uropods hardly longer than the last somite.

The identification of the specimens described above with Mr. G. M. Thomson's species is only possible on the assumption that he was in error in describing the basis of the first legs as ending in a long spiniform process. The two long plumose setæ at the end of the basis in my specimens are often encrusted with mud and matted together so as to form what appears at first sight to be a solid process having very much the shape and proportions of the process figured by Mr. Thomson. Until some other species is discovered agreeing more closely in this respect with Mr. Thomson's figures, his name may be applied to the form here described.

Occurrence.—New Zealand, "Lyttleton Harbour, 1-5 fathoms, 8, 97, H. Suter Coll."; "Akaroa Harbour, H. Suter Coll." Copenhagen Museum. "Otago Harbour, surface-net, G. M. Thomson." British Museum.

CYCLASPIS ELEGANS, sp. n. (Plate II.)

Description of adult Female.—Total length 6.3 mm.

Resembling *C. exsculpta* Sars and *C. persculpta* Calman in having the carapace strongly sculptured. The carapace is about one-third of the total length, and its vertical height is two-thirds of its length. On each side is a quadrilateral area, answering to the "lateral depressed area" in Sars's description of *C. exsculpta*, bounded

by ridges which rise at the corners into four prominent tubercles. There are no transverse crests across the dorsal surface, but there is a well-marked, obscurely granulated, median dorsal keel which rises at its posterior end into a blunt tooth. The depressed area occupies the greater part of the lateral surface; its upper margin is sinuous and its posterior margin nearly parallel to the hinder margin of the carapace. The lower horizontal ridge is produced in front and behind to the edge of the carapace, and the upper is continued forwards on to the side of the pseudorostrum. The greatest width of the carapace is measured between the postero-inferior tubercles. The ocular lobe is little longer than broad and reaches nearly to the tip of the pseudorostrum. The eye is without pigment; there are about nine corneal facets.

The first leg-bearing somite is almost entirely concealed, only a small portion being visible laterally. The second is large, nearly equal in height to the carapace, with a dorsal crest produced backwards into a sharp tooth and with the lateral plates expanded. The posterior thoracic somites have a median dorsal keel, which is continued on all the abdominal somites except the last. There are less distinct dorso-lateral keels on the last two thoracic and the first two abdominal somites. The first five abdominal somites have lateral articular processes anteriorly.

The appendages are very similar to those of *C. australis* as figured by Sars. The antennules are a little more slender and appear to lack all trace of the inner flagellum. The antennæ have a long and slender external process which is not segmented off from the basal part. The mandibles have about eighteen spines on the inner edge. The lower lip has the tip of each lobe sharply bent inwards and armed with a group of peculiar spatulate spines. The palp of the maxillula is about one and a half times as long as the distance between its base and the tip of the distal lobe and bears two long setæ.

The first maxilliped differs from that of *C. australis* in the longer basis, which exceeds in length the other segments together. The terminal segment is very small. The branchial apparatus is well developed; the epipod is produced forwards nearly as far as the end of the basis, and carries about thirteen branchial lobules.

The second maxilliped is slender, its basis exceeding by two-thirds the length of the remaining segments together. There are about twelve long setæ on the basal lamina.

The third maxilliped has the basis sharply bent outwards about the middle of its length. Otherwise it resembles the corresponding limb of *C. australis*.

The first leg does not extend much beyond the tip of the pseudorostrum in the natural position, and its distal segments are not so slender as in *C. australis*.

The remaining legs are similar to those of *C. australis*, but carry longer setæ. The terminal segment of the second pair has three terminal but no lateral spines.

The uropods have the peduncle stout and but little shorter than the last somite. The rami are subequal and about equal in length to the peduncle. The endopod

is slightly curved upwards and outwards at the tip; the distal half of its inner edge is strongly serrated and bears a single small pectinate spine. The exopod has a short apical spine and a series of plumose setæ on the inner margin.

Adult Male.—Total length 6.2 mm.

The carapace is about two-sevenths of the total length, its vertical height not much more than one-half of its length. The dorsal outline is less strongly arched than in the female. The ridges defining the depressed area on the lateral surface are less prominent. The tubercles at the two lower corners and that at the anterior upper corner are well-marked, but there is no posterior upper tubercle, and the upper horizontal ridge does not meet the posterior vertical ridge. Seen from above, the carapace is not wider behind than in front. The ocular lobe and the corneal facets which it bears are considerably larger than in the female. The antennal notch is somewhat shallower, and the antennal tooth is slightly different in form.

The first leg-bearing segment is entirely concealed. The second is as high as the posterior part of the carapace. Its dorsal crest is rounded, not produced, and the lateral plates are not expanded. The dorso-lateral keels of the last two thoracic and the first two abdominal somites are more strongly developed than in the female. As usual, the abdominal somites are much stouter than in the female. The fifth somite is laterally constricted in its posterior half.

The antennules are similar to those of the female, with a single additional sensory filament springing from the end of the third segment. The antennæ resemble those of *C. longicaudata* as figured by Sars, except that the distal segment of the peduncle is shorter and stouter and the setæ clothing it are shorter. The branchial apparatus is more fully developed than in the female, the lobules being about seventeen in number.

The pleopods appear to differ from those of *C. longicaudata* in lacking the process from the outer margin of the endopod.

The uropods are longer than in the female. The peduncle is about as long as the last somite and is beset along the whole of its inner edge with plumose setæ. The rami are about equal in length to the peduncle, the inner slightly shorter, and resemble those of the female except that the endopod, as well as the exopod, has its inner edge beset with plumose setæ.

Young Stages.—In a specimen 1.75 mm. in length (Pl. II. fig. 5) there is no trace of the last pair of legs. The integument is well-calcified and brittle. No corneal facets are visible on the ocular lobe, and the lateral articular processes of the abdominal somites are not yet developed. The first leg-bearing somite is entirely concealed. On the side of the carapace the ridges bounding the depressed area are well-marked, but of the four tubercles only the anterior upper one is prominent.

Specimens about 5 mm. in length (Pl. II. fig. 6) have assumed nearly the form of the adult, but the first leg-bearing somite is still concealed. It is noteworthy that at this stage the male resembles the adult female more closely than it does when full-grown.

Remarks.—As already stated, this very beautiful species, which, from the abundance of the material, I have been able to describe with some detail, resembles *C. exsculpta* Sars and *C. persculpta* Calman, but it is at once distinguished from them by the different sculpture of the carapace, especially by the absence of transverse crests on the dorsal surface. In the structure of the appendages it shows great similarity to *C. australis* Sars, while at the same time it seems to present no differences of generic value from the type of the genus, *C. longicaudata* Sars.

Occurrence.—"Lyttleton Harbour, New Zealand, 1-5 fathoms, H. Suter Coll." Many specimens. Copenhagen Museum. Co-types in British Museum.

CYCLASPIS SIMILIS, sp. n. (Plate III. figs. 1-3.)

Description of adult Female.—Total length 5.75 mm.

Resembling *C. elegans* in shape and general proportion of the body. The lateral depressed area on the carapace is less distinctly excavated, and the only prominent tubercle is that representing the anterior upper tubercle of the species named. The lower horizontal ridge is produced forwards to the edge of the carapace, but posteriorly it is continued with an even curve into the posterior vertical ridge, and does not extend to the posterior edge of the carapace. The posterior vertical ridge at its upper end forks into two branches diverging at an obtuse angle. The anterior one does not reach the ridge which runs backwards from the anterior upper tubercle, so that the upper margin of the depressed area is not completely enclosed. The sides of the carapace posteriorly are more or less rugose.

The first leg-bearing somite is exposed only at the side. The dorsal crest of the second is produced backwards into a large rounded lobe. The remaining somites are similar to those of *C. elegans*, but the dorso-lateral crests are stronger and are continued as far as the penultimate somite.

The thoracic appendages, so far as they can be seen in the undissected specimen, present no conspicuous differences from those of *C. elegans*.

The peduncle of the uropods is shorter than the last somite and is finely serrated internally. The rami are shorter than the peduncle. The endopod is not curved at the tip as in *C. elegans*, and is less strongly serrated internally. The exopod has an apical spine, and some plumose setæ on its inner edge.

An immature male specimen 5.25 mm. in length differs little in general characters from the female described above. The first leg-bearing somite is hidden, and the second is not produced above into a cristiform lobe.

Remarks.—This species resembles *C. elegans*, in company with which it was found. It is distinguished, however, by the different sculpture of the carapace.

Occurrence.—"Lyttleton Harbour, New Zealand, 1-5 fathoms, H. Suter Coll." Copenhagen Museum. Co-type (young) in British Museum.

CYCLASPIS UNIPPLICATA, sp. n. (Plate IV. figs. 11-20.)

Description of immature Female.—Total length 4.9 mm.

The carapace is distinctly less than one-third of the total length, somewhat compressed, its vertical height not much more than one-half of its length. The dorsal edge is sharply keeled, only slightly curved as seen from the side, with a prominent forwardly directed tooth overhanging the base of the ocular lobe. On each side of the carapace is a low but sharply marked ridge meeting its fellow about the middle of the dorsal edge and running downwards and forwards in the direction of the antero-lateral corner, which, however, it does not reach. Pseudorostrum short and truncated, the ocular lobe reaching quite to the tip. Antennal notch shallow, widely open. Antennal tooth double, the true antero-lateral angle having external to and below it a sharp spiniform tooth. The ocular lobe not longer than broad; eye pigmented, with about nine corneal lenses.

The first leg-bearing somite is exposed dorsally. The second somite has a slight dorsal keel.

The abdomen is distinctly longer than the cephalothoracic region, subcylindrical, and rather slender.

The antennule has the third segment of the peduncle longer than the second, the first distinctly longer than the other two together. The inner flagellum is distinct.

The first maxilliped has the basis shorter than the distal segments together. The second maxilliped is rather stout, and has also the basis shorter than the distal segments. In the third maxilliped the basis is longer than the distal segments, and its distal process is very long, reaching to the end of the carpus.

The first legs are very long, extending beyond the tip of the pseudorostrum in the natural position by about two-thirds the length of the carapace. The basis is less than two-thirds of the length of the distal segments, and is produced on the lower side of the following segment into a sharp tooth.

The second legs are stout and have the basis shorter than the distal segments together.

In the remaining legs the basis successively diminishes in length, being longer than the distal segments in the third pair and about half their length in the fifth pair.

The peduncle of the uropods is longer by one-fourth than the last somite, equal to the endopod, and shorter than the exopod. The endopod tapers to a sharp point, and has about nine short spines on its inner edge. The exopod has a slender apical spine and three short spines on its inner edge.

Remarks.—In the general shape of the body and in having a tooth at the distal end of the basis of the first legs this species resembles *C. herdmanni* and *C. hornelli* Calman, approaching the latter species especially in the length of the first legs and in the armature of the uropods. From both it is distinguished by the oblique ridge and the dorsal tooth of the carapace. F. Müller ('Für Darwin,' p. 54 (English ed.

p. 81), fig. 52) figures the male of a "*Bodotria*" having a single tooth on the dorsal crest. It may possibly have been a species allied to the present.

Occurrence.—Gulf of Siam, "Koh Kam, 5–10 fathoms. Th. Mortensen Coll." Several specimens. Copenhagen Museum. Co-types in British Museum. Two young and imperfect specimens of this species were obtained by Prof. Herdman in Ceylon, and were recorded as "*Cyclaspis* sp." in my Report on his collections (Rep. Ceylon Pearl Fisheries, Royal Society, pt. ii. 1904, p. 160).

CYCLASPIS UNICORNIS, sp. n. (Plate V. figs. 9–11.)

Description of immature Female.—Total length 3.2 mm.

The carapace is about one-third of the total length. The dorsal edge keeled, slightly arched as seen from the side, and armed about a third of its length from the anterior end with a sharp forwardly curved tooth. Pseudorostrum slightly prominent, the ocular lobe reaching quite to the tip. Antennal notch wide; antennal tooth acute, not reaching quite as far forward as the tip of the pseudorostrum. The side of the carapace is rough with small granules.

The first leg-bearing somite is hidden, the second has a slight dorsal crest.

The abdomen is a little longer than the cephalothoracic region. The somites are subcylindrical, with lateral articular processes.

The first legs extend beyond the tip of the pseudorostrum in the natural position for less than one-third of the length of the carapace. The basis is about three-fourths of the length of the distal segments together. The ischium and merus are very stout, the former with the inner edge serrated. The three distal segments are very slender; the carpus and propodus of equal length, and each about one-half longer than the dactylus.

The peduncle of the uropods is longer by about one-quarter than the last somite and has its inner edge finely serrated. The endopod is about two-thirds the length of the peduncle, serrated on the inner edge, with a slender apical spine and four spinules on the inner edge. The exopod is a very little longer than the endopod, has a slender apical spine with a small spinule at its base and another a little way down on the inner side.

Remarks.—In the possession of a single dorsal tooth on the carapace this species resembles the last, but it differs in the absence of the lateral ridge on the carapace and in many other characters. There is also a certain general resemblance to *Stephanomma goësi* Sars. It is stated, indeed, by Sars that in that species the lateral lobes of the pseudorostrum are absent and there is no "frontal fissure"; but I am inclined to suspect that Sars has been misled by the ocular lobe reaching quite to the tip of the pseudorostrum, and that *Stephanomma* will be found not to differ generically from some of the species at present referred to *Cyclaspis*.

Occurrence.—"Cruz Bay, St. Jan" (Danish West Indies). One specimen. Copenhagen Museum.

CYCLASPIS CINGULATA, sp. n. (Plate IV. figs. 1-10.)

Description of immature Female.—Total length 4.2 mm.

The carapace is about two-fifths of the total length, somewhat compressed, its dorsal surface as seen from the side strongly arched, and its posterior margin sloping backwards so as to conceal more or less the first two thoracic somites when viewed from above. It is encircled by a very prominent ridge or collar, which crosses the dorsal surface a little in front of the middle of its length and slopes a little forwards as it passes down each side. In the mid-dorsal line this collar is interrupted by a deep notch. On the dorsal surface of the carapace in the posterior third of its length is a pair of ridges, slightly diverging and becoming more strongly marked posteriorly and bearing a few scattered setæ. External to and below the frontal fissure on each side is a slight prominence. The pseudorostrum is short, horizontal, and the long, narrow, ocular lobe extends quite to the tip, projecting in front of the lateral lobes. The corneal lenses are 11 in number and are grouped on the distal end of the ocular lobe. The antennal notch is small, and the antennal tooth is well behind the tip of the pseudorostrum.

The first leg-bearing somite is well exposed, the fourth and fifth have well-marked dorso-lateral keels, and the fifth has also a slight median keel. The abdomen is about equal in length to the cephalothoracic region and rather stout. All the abdominal somites except the last have strong dorso-lateral keels. The first four have a well-marked dorsal keel which becomes faint on the fifth.

The antennule has the third segment of the peduncle longer than the second, the first about equal to the other two together. The vestigial inner flagellum is very distinct. The antenna appears to lack the external process.

The third maxilliped has the basis little longer than the distal segments together. Its distal process is very long, reaching nearly to the end of the carpus.

The first leg is long, extending beyond the end of the pseudorostrum in the natural position by nearly the length of the last two segments. The basis is about four-fifths of the length of the distal segments together, and is a little produced on the lower side of the following segment. The remaining legs are rather short and stout. In the second pair the basis is less than two-thirds the length of the distal segments together.

The peduncle of the uropods is distinctly shorter than the last somite and has a single small seta on its inner edge. The endopod is a little longer than the peduncle and distinctly longer than the exopod, tapering to a sharp point, and with three small spines about the middle of its inner edge. The exopod has an apical spine and a few very small setæ on its outer and inner margins.

Male.—A single adult male, which may possibly belong to this species, is unfortunately so much damaged that it cannot be described in detail. It agrees with the

female in the very long and narrow ocular lobe, but the carapace is smooth, with only a faint trace of the encircling ridge so conspicuous in the female and without the paired dorsal ridges posteriorly. On the lower part of the side of the carapace is a horizontal ridge, also very faint, meeting the encircling ridge anteriorly. The dorso-lateral keels are well-marked on the last two thoracic somites, but the abdominal somites, which are very stout, have no distinct keels. The terminal segments of the first pair of legs are longer and more slender than in the female.

Remarks.—In the sculpture of the carapace this species is quite distinct from any other, and it is not easy to see in what direction its immediate allies are to be sought. In the long and narrow ocular lobe it resembles *C. exsculpta* Sars and *C. persculpta* Calman. In the distinctness of the first leg-bearing somite it approaches especially *C. costata* and *C. picta* Calman.

Occurrence.—Several localities in the Gulf of Siam. "Koh Kam, 5–10 fathoms." "Between Koh Mesan and Cape Liant, 5–8 fathoms." "Tung Kaben, 6 fathoms." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

CYCLASPIS THOMSONI, sp. n. (Plate V. figs. 12–16.)

Description of adult Female.—Total length 6 mm.

The carapace is little more than one-fourth of the total length, slightly compressed, its vertical height little more than half its length. The dorsal edge with a distinct keel, which is flattened or faintly doubled posteriorly, slightly arched as seen from the side, with a slight concavity at the base of the pseudorostrum. Pseudorostrum short; the ocular lobe reaching to or a little beyond the tip of the lateral lobes. Antennal notch rather widely open; antennal tooth triangular. The surface of the carapace is everywhere beset with shallow pits, which in full-grown specimens give it a rugose appearance. On each side, a little behind the middle of its length, is a short groove, limited behind by a faintly marked ridge running obliquely downwards and backwards. A slight ridge runs backwards for a short distance from the antennal tooth.

First leg-bearing somite exposed at the sides only. Second with a distinct dorsal keel. Last three with lateral keels.

Abdomen a little longer than the cephalothoracic region; the somites subcylindrical, with distinct median dorsal and lateral keels and the usual lateral articular processes.

First legs of moderate length, extending beyond the tip of the pseudorostrum by little more than one-fourth of the length of the carapace. The basis is a little shorter than the distal segments together and is not produced into a tooth distally; it bears two densely plumose hairs at its distal end. The dactylus is about two-thirds as long as the propodus and three-fourths as long as the carpus.

The peduncle of the uropods is longer than the last somite by nearly one-third. The endopod is a little shorter than the peduncle, acutely pointed at the tip, without an apical spine, with four spinules on its inner edge. Exopod a little longer than

the endopod, with a slender apical spine and a series of plumose setæ on its inner edge.

Adult Male.—Total length 6.75 mm.

Proportions and shape of carapace much as in female, but with pseudorostrum rather less prominent and ocular lobe distinctly projecting beyond the lateral lobes. Surface of carapace smoother than in the female, the pitting less distinct and the oblique groove faintly marked.

First leg-bearing somite quite concealed, fourth with a slight lateral ridge, fifth with a double lateral ridge.

Abdominal somites with median dorsal but no lateral keels.

Proportions of uropods much as in female, but the rami rather less unequal. Endopod with about nine spinules and a series of plumose setæ on its inner edge. Peduncle with its inner edge beset with long plumose setæ.

Remarks.—This species is closely allied to *C. levis* G. M. Thomson, but it differs from the specimens which I refer to that species in the much rougher surface of the carapace and the presence of an oblique groove on each side; in a slightly different outline of the dorsal edge of the carapace, which is distinctly concave at the base of the pseudorostrum; and in certain trifling differences of proportion in the first legs and uropods. In the male, where the oblique grooves of the carapace are inconspicuous, there is a certain similarity of outline to Mr. Thomson's figure of the male *C. levis*, suggesting that his figure may have been drawn from a specimen of the present form. Since he expressly says, however, that the surface of the carapace in *C. levis* is "smooth, destitute of ridges or sculpturing," I have retained his name for the closely allied species to which this description more nearly applies.

Occurrence.—New Zealand, "Bay of Islands, 8 fathoms." A number of specimens, mostly immature, taken at the same time as the type specimens of *C. levis*, were sent to me by Mr. G. M. Thomson.

CYCLASPIS BIPPLICATA, sp. n. (Plate III. figs. 4-15.)

Description of adult Female.—Total length 4.2 mm.

The carapace is about two-sevenths of the total length, somewhat compressed, its vertical height less than two-thirds of its length. The dorsal edge, seen from the side, is only slightly arched. There is a sharp median dorsal keel which rises at the posterior end into a broad truncated tooth. On each side of the carapace are two parallel ridges, running obliquely forwards and downwards and dying out before reaching the lower edge of the carapace. At their upper ends they converge and meet each other close to the median keel a little behind the middle of the carapace. These ridges, though sharply defined, are not prominent, and hardly interrupt the lateral outlines of the carapace as seen from above. The ocular lobe is a little longer than

broad, and reaches nearly to the tip of the pseudorostrum. There are about nine corneal facets, but the eye is without pigment.

The first leg-bearing somite is only visible at the sides. The second has the dorsal crest produced upwards into an acute tooth curving slightly forwards at the tip. The posterior thoracic and the anterior abdominal somites have a median dorsal keel becoming fainter posteriorly.

The antennules have the third segment of the peduncle longer than the preceding, and the inner flagellum represented by a minute vestige. The antennæ have the outer process short and distinctly segmented off from the basal part. The mouth-parts resemble very closely those of *C. elegans*. The first legs extend well beyond the tip of the pseudorostrum in the natural position. The basis exceeds only by about one-fifth the combined length of the distal segments. The terminal segment is equal in length to the preceding. The remaining legs are similar to those of *C. elegans*.

The peduncle of the uropods is a little longer than the last somite and bears five plumose setæ on its inner edge. The rami are subequal and are about equal in length to the peduncle. The endopod has the inner edge serrated and carrying a single small seta near the tip. The exopod has a slender apical spine and several plumose setæ on its inner edge.

Adult Male.—Total length 4.16 mm.

The carapace is less deep than in the female and more compressed. The tooth at the posterior end of the dorsal crest is low and rounded. The oblique ridges on the sides of the carapace are similar in position to those of the female, but less strongly marked and do not meet above. The antennal notch is more widely open and the tooth defining it is more obtuse than in the female.

The first leg-bearing somite is hidden. The second is produced dorsally into an acute forwardly curved tooth, more slender than that of the female.

The first legs have the basis longer by one-half than the distal segments together.

The uropods do not differ in their proportions from those of the female, but the setæ on the inner edge of the peduncle are much more numerous and the inner edge of the endopod is also fringed with setæ.

Remarks.—This species resembles *C. bistriata* Zimmer (Zool. Jahrb., Abth. Syst. xvii. p. 447, 1902), but appears to differ in the outline of the carapace, which has the dorsal edge less curved, in the position of the lateral ridges, and in the longer peduncle of the uropods, which in the species named is shorter than the rami. Except for the absence of the lateral ridges of the carapace, Zimmer's figure of the male *C. argus* (t. c. p. 445, fig. A) resembles very closely the male of the present species. Without a re-examination of the type specimens it seems impossible to decide whether one or both of these species may not be identical with that here described.

Occurrence.—"Lyttleton Harbour, New Zealand, 1-5 fathoms, H. Suter Coll." Numerous specimens. Copenhagen Museum. Co-types in British Museum.

CYCLASPIS TRIPLICATA, sp. n. (Plate III. figs. 16-24.)

Description of adult Female.—Total length 4.0 mm.

Very similar in general form to *C. biplicata*. The carapace is more inflated posteriorly. The two oblique ridges on the side of the carapace have much the same course as in that species, but are much more prominent, while in front of these is a prominent tubercle occupying about the position of the anterior upper tubercle in *C. elegans*, from which a third nearly vertical ridge runs downwards and joins a prolongation of the anterior oblique ridge which turns horizontally forwards to the anterior lower edge of the carapace. The tooth at the posterior end of the dorsal keel is slightly different in shape from that of *C. biplicata* and has the hinder edge finely serrated.

The dorsal crest of the second leg-bearing somite differs from that of *C. biplicata* in having the upper angle blunt, the oblique dorsal edge sinuous, and the posterior angle prominent and overhanging the third somite. The median dorsal keel is very slightly marked on the posterior thoracic and anterior abdominal somites, but a pair of dorso-lateral keels, not seen in *C. biplicata*, are developed on the last two thoracic and the first three abdominal somites.

The antennules have the third segment of the peduncle a little shorter and stouter than in *C. biplicata*.

The first legs are shorter than in *C. biplicata*. The basis exceeds by one-half the combined length of the distal segments. The posterior legs have longer and more numerous setæ.

The uropods are similar to those of *C. biplicata*, but are a little stouter.

Adult Male.—Total length 4.0 mm.

The male closely resembles that of *C. biplicata*, from which, however, it is at once distinguished by the presence of the additional anterior ridge on the carapace. As in the female, this ridge rises above into a blunt tubercle, which is very conspicuous when the carapace is viewed from above. In this species, moreover, the last two thoracic and the first abdominal somites bear strongly marked dorso-lateral ridges, the dorsal tooth of the second leg-bearing somite is shorter and more curved, and the first legs are rather shorter than in *C. biplicata*.

Remarks.—Both in general aspect and in the details of its appendages this species resembles very closely that last described, in company with which it occurred.

Occurrence.—"Lyttleton Harbour, New Zealand, 1-5 fathoms, H. Suter Coll." Many specimens. Copenhagen Museum. Co-types in British Museum.

Genus EOCUMA.

I have discussed the characters and the limits of this genus in a former paper (Herdman's Rep. Ceylon Pearl Fisheries, Royal Society, pt. ii. (1904), Suppl. Rep. xii. Cumacea, p. 160). The material now examined reveals the existence of a number of closely allied species. Unfortunately they are represented, for the most part, by immature and sometimes damaged specimens, and it is only after some hesitation that I describe the four new species which follow, leaving aside for the present solitary and more or less imperfect specimens of three species, which may be distinct, from Aden, Trincomalee, and Penang respectively.

The new species have the lateral margins of the carapace carinated and the pseudorostrum projecting in front of the lateral cornua, and they therefore come under the division A. 1 in the key to the genus which I gave in my previous paper (*t. c.* p. 161). This part of the key may be extended as follows to include them:—

- a.* Antero-lateral teeth of carapace low and rounded (female) or absent (male); no paired ridges on dorsal surface.
 - a'.* (Male.) Cornua of carapace small, directed forwards; antero-lateral margin strongly convex; peduncle of antennule not elongated. *E. taprobanica* Calman.
 - b'.* (Male.) Cornua of carapace prominent, directed obliquely outwards; antero-lateral margin only slightly convex; peduncle of antennule much elongated. *E. longicornis*, sp. n.
- b.* Antero-lateral teeth more or less prominent, acute.
 - a'.* Carapace nearly as broad as long, with paired dorsal ridges; antero-lateral teeth reaching nearly or quite as far forward as the pseudorostrum.
 - a''.* Frontal margin with a small tooth on each side between the pseudorostral lobe and the antero-lateral tooth *E. stellifera*, sp. n.
 - b''.* Frontal margin without a tooth between the pseudorostral lobe and the antero-lateral tooth.
 - a'''.* Antero-lateral teeth acutely produced, directed obliquely outwards *E. hilgendorfi* Marcusen.
 - b'''.* Antero-lateral teeth obtusely triangular, with acute spiniform points directed forwards *E. lata*, sp. n.
 - b'.* Carapace hardly more than half as broad as long, without paired dorsal ridges; antero-lateral teeth not reaching nearly as far forward as pseudorostrum *E. producta*, sp. n.

EOCUMA LONGICORNIS, sp. n. (Plate VI. figs. 1–6.)

Description of adult Male.—Total length 7.65 mm.

Carapace little more than one-quarter of the total length, its greatest width,

excluding the lateral cornua, a little over half its length. Lateral keels well marked. Cornua prominent, directed obliquely outwards, situated behind the anterior third of the length of the carapace. The postero-lateral margins are nearly straight. The width of the posterior margin is about half of that measured between the bases of the cornua. The pseudorostrum is prominent and formed of two rounded lobes. Antero-lateral margins between pseudorostrum and cornua very slightly convex. The transverse ridge on the lower surface on each side is faintly marked and does not reach the lateral margin. Dorsal surface with a faintly marked median ridge posteriorly. The ocular lobe is twice as broad as long, and the pseudorostral plates meet in front of it for a distance much greater than its length. The eye is not pigmented, but there are three large indistinctly defined corneal areas. The surface everywhere shows a regularly reticulated texture, which is not interrupted by a faint and inconspicuous pitting.

Abdomen less than one-third longer than cephalothoracic region, scarcely narrowed posteriorly.

Antennules with very long and slender peduncle; third segment one and a half times as long as the second and a little longer than the first, about six times as long as broad. External flagellum of three segments, about two-fifths as long as last segment of peduncle.

First legs long and slender. Basis little more than two-thirds of length of distal segments together. Carpus about equal to the propodus and nearly half as long again as the dactylus.

The basis of the second legs has two or three rather coarse serrations on its inner edge near the distal end.

The uropods are more than one and a half times the length of the last somite. The peduncle is about two-fifths of the length of the subequal rami. The inner edges of the peduncle and endopod and both edges of the exopod are fringed with plumose setæ and the endopod also bears three small spinules.

Remarks.—The only species of *Eocuma* of which the male has been described is *E. taprobanica*. From that species the present form is distinguished by the more prominent frontal lobes, the less convex antero-lateral margins, the laterally projecting cornua, the much longer and more slender antennular peduncle, and other characters. It is unlikely that it will prove to be the male of any of the other known species, since, even if the absence of antero-lateral teeth should prove to be only a sexual character, the very narrow carapace and projecting lateral cornua, together with the long first legs, seem sufficient to distinguish it.

Occurrence.—"Suez, 31/1/98, H. Mortensen." Two specimens. Copenhagen Museum.

Eocuma lata, sp. n. (Plate VI. figs. 7-12.)

Description of immature Female.—Total length 3.9 mm.

The carapace is less than two-sevenths of the total length, very broad and flattened, with well-marked lateral carinae. The greatest width, across the lateral cornua a little behind the anterior third, is very little less than the length. The lateral cornua are short, with acute tips directed forwards. The postero-lateral edges are nearly straight. The width of the posterior margin is less than half that measured across the cornua. The pseudorostrum is prominent, and formed, as seen from above, of two rounded lobes. External to these on each side the antero-lateral margin forms an obtusely triangular tooth with an acute spiniform point, turned forwards, not reaching so far as the level of the pseudorostral lobes. Between this antero-lateral tooth and the lateral cornu the margin is nearly straight. The dorsal surface is slightly arched and has no distinct median keel, but a pair of well-marked dorso-lateral keels running from about the posterior ends of the frontal suture to the hind margin. On the under-side a transverse ridge runs from a little behind the lateral cornu to the free margin of the carapace. The ocular lobe is not broader than long and the pseudorostral plates meet in front of it for a distance greater than its length. The eye is not pigmented and no corneal facets were observed.

The surface of the carapace is beset with shallow pits which interrupt as clear spots the minute reticulate texture of the exoskeleton. The centre of each pit is occupied by a minute granule (or perhaps a pore).

The slender abdomen is longer by more than one-fourth than the cephalothoracic region. The fifth somite is about three and a half times as long as broad. The last somite is depressed and expanded laterally, being, at its posterior end, one and a half times as broad as the preceding somite. The antennules have the first segment of the peduncle longer than the other two together, the third not quite half as long again as the second and less than three times as long as broad.

The distal segments of the first legs are together about one and three-quarters as long as the basis. The carpus is equal to the propodus and nearly one-third longer than the dactylus.

The uropods are about two-thirds longer than the last somite. The peduncle is a little more than one-third of the length of the subequal rami. There is a plumose seta on the inner edge of the peduncle and another, along with three spinules, on the inner edge of the endopod.

Remarks.—The specimens here described are very immature as compared with the sub-adult specimens of *E. taprobanica* formerly described. This is shown especially by the characters of the branchial apparatus, which has only about eleven lobules, becoming very small posteriorly, and probably also by the fact that there is no spine on the ischium of the second legs. Further, the outline of the carapace has a distinct resemblance to

that of the young specimens of *E. taprobatica* (t. c. pl. i. fig. 5). I believe, however, that the present species is sufficiently distinguished by the greater breadth of the carapace and by the presence of two dorso-lateral keels, since these characters are not likely to be greatly modified in the adult. *E. hilgendorfi*, which also possesses dorso-lateral keels, can hardly be the adult stage of the present form, since it has the antero-lateral teeth greatly produced, while, from the analogy of *E. taprobatica*, we should expect these teeth to become less prominent as development proceeds.

Occurrence.—Gulf of Siam, "Koh Kam, 5–10 fathoms," "Between Koh Mesan and Cape Liant, 5–8 fathoms." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

EOCUMA STELLIFERA, sp. n. (Plate VI. figs. 13–17.)

Description of immature Female.—Total length 5.6 mm.

Carapace little more than one-quarter of the total length, very broad and flattened, with well-marked lateral carinæ. The greatest width, across the lateral cornua at about the anterior third of the carapace, is about eight-ninths of the length. The lateral cornua are rather stout and incurved at the tips. The postero-lateral edges are slightly concave. The width of the posterior margin is about two-fifths of that measured across the cornua. The pseudorostral lobes are not very prominent; each is rounded at its inner end, then concave, and what may be regarded as its outer end forms a low rounded tooth over the base of the antennule. External to this, and separated from it by a concavity of the margin, is the antero-lateral tooth, which is acute and produced forwards as far as the level of the frontal lobes. Between the antero-lateral tooth and the lateral cornu the margin is nearly straight. The dorsal surface is slightly arched and has a slight median keel posteriorly. Paired dorso-lateral keels are also present, but are not so marked as in *E. lata*. On the underside the transverse ridge is much as in *E. lata*. The ocular lobe is broader than long and the pseudorostral plates meet in front of it for a distance greater than its length. The eye is not pigmented and no corneal facets were observed. The surface of the carapace is closely beset with shallow pits, and the meshes of the primary reticulated texture of the exo-skeleton are arranged in a more or less regular radial manner around each pit. Under a moderate magnification the carapace appears covered with stellate clear spots.

The proportions of the abdomen are much as in *E. lata*.

The antennules have the first segment of the peduncle longer than the other two together and the third longer than the second.

The first legs are very long and slender. The distal segments are about two and a half times as long as the basis. The latter has its distal process very long and acute and directed obliquely inwards. The carpus is one-quarter longer than the propodus and more than twice as long as the dactylus.

The uropods are little more than one-third longer than the last somite. The peduncle

is a little more than one-third of the length of the subequal rami. There are three plumose setæ and three spinules on the inner edge of the endopod and a minute seta on the inner edge of the peduncle.

A younger specimen, 3.7 mm. in length, agrees with that described above in the form of the carapace.

Remarks.—The specimens described above, though immature, differ so much from the species hitherto described in the shape of the frontal region of the carapace, in the great length of the first pair of legs, and in the stellate texture of the integument, that there can be no doubt of their specific distinctness.

Occurrence.—Gulf of Siam, "Between Koh Mesan and Koh Chuen, 15 fathoms," and "Between Koh Mesan and Cape Liant, 8 fathoms." Th. Mortensen Coll., Copenhagen Museum.

EOCUMA PRODUCTA, sp. n. (Plate VI. figs. 18–20.)

Description of immature Female.—Total length 4.6 mm.

Carapace a little over one-quarter of the total length, flattened and with well-marked lateral carinæ. The greatest width, across the lateral cornua at a little behind the anterior third of the carapace, is a little more than half the length. The lateral cornua are not very prominent, with the tips directed forwards. The postero-lateral edges are slightly convex. The width of the posterior margin is nearly two-thirds of that measured across the cornua. The pseudorostral lobes are rounded and very prominent, projecting far in front of the antero-lateral teeth, which are small and blunt. Between the antero-lateral tooth and the lateral cornu the margin is straight. The dorsal surface is slightly arched and is without distinct median or dorso-lateral keels. The transverse ridge on the underside is faintly marked. The ocular lobe is longer than broad and the pseudorostral plates meet in front of it for a distance greater than its length. The eye is not pigmented. The integument is thin and transparent and minutely reticulated.

The antennules were not dissected out, but they have the peduncle rather elongate, the last segment being about four times as long as broad.

The first legs are rather short, extending but little beyond the pseudorostrum. The basis is four-fifths of the length of the distal segments together. The carpus is a little shorter than the propodus and a little longer than the dactylus.

The basis and ischium of the second legs have several teeth on the inner edge.

The uropods are longer by nearly two-thirds than the last somite. The peduncle is less than one-third of the length of the subequal rami. The inner edges of the peduncle and of the proximal half of the endopod are beset with plumose setæ and the distal half of the endopod carries two spinules.

Remarks.—The specimen described above is distinguished from all the species of which the females are known by the narrow carapace and the very prominent pseudorostrum. In general shape it shows some resemblance to the much larger male

specimen described above as *E. longicornis*, and it also approaches that species in the elongate peduncle of the antennule. It is distinguished, however, not only by the marked antero-lateral teeth, but by the shorter first legs.

Occurrence.—"Penang, Didrichsen." Copenhagen Museum.

Genus ZYGOSIPHON, gen. nov.

Carapace with double pseudorostral projection and two widely separated and very long branchial siphons. Five leg-bearing somites distinct. Basis of third maxillipeds produced distally. Only the first pair of peræopods with exopods. Endopod of uropods of two segments, distal segment short.

Type species *Z. mortenseni*, sp. n.

This new genus is distinguished chiefly by the remarkable development of the branchial siphons and their separation from one another, and by the correlated peculiarities in the shape of the anterior part of the carapace. In other respects it does not differ very strikingly from some of the existing genera of Bodotriidæ.

ZYGOSIPHON MORTENSENI, sp. n. (Plate VII. figs. 1-19.)

Description of adult Female.—Total length 2.67 mm.

The carapace is about two-sevenths of the total length, somewhat compressed, its vertical height two-thirds of its length. The dorsal edge is slightly arched and rises in a rounded transverse ridge posteriorly. Viewed from above, the carapace is rather broader in front than behind, with nearly straight or, in ovigerous specimens, concave sides. In front it is squarely truncate, having at the corners, which are somewhat produced, the two widely separated branchial orifices from which are protruded the very long branchial siphons directed obliquely upwards and outwards. There are thus two short pseudorostral processes instead of one. Seen from the side they are obliquely truncated, with the lower corner projecting in front of the upper. The lateral pseudorostral plates meet for a short distance in front of the ocular lobe. The antennal notch is rounded and widely open, and the antennal tooth is triangular and rather prominent. The ocular lobe is very broad, with its anterior margin notched so as to indicate a division into two parts. It contains two separate masses of ocular pigment, but there are no distinct corneal lenses. On each side of the carapace is a lozenge-shaped depression bounded by indistinctly marked ridges. From its anterior corner a ridge runs forward on to the side of the pseudorostrum, and above this the surface is slightly excavated on each side of the middle line.

The first leg-bearing somite is completely exposed, and, like the second, is nearly equal in height to the posterior part of the carapace. The three posterior somites are much lower and diminish rapidly in width posteriorly. In ovigerous specimens the greatest width of the body is reached at the second free somite.

The abdomen is longer than the cephalothoracic region, the somites subcylindrical and having well-developed lateral articular processes.

Antennule having the first segment of the peduncle longer than the other two together, the third twice as long as the second. The accessory flagellum is represented by a minute nodule; the outer flagellum has two segments. Antennæ simple, unsegmented and without a terminal process, bearing two plumose setæ.

Mandible of the usual form, bearing about twelve spines. Lower lip not seen.

Maxillular palp longer than the distance from its base to tip of distal lobe, with two terminal setæ.

The first maxilliped has the basis much shorter than the remaining segments together. The posterior portion of the branchial apparatus proved very difficult to isolate, but its lobules are very slightly developed, only two small papillæ being observed. The anterior portion, however, is remarkably developed, its distal part forming a long siphon capable of extension and retraction. The proximal part or stalk is, as usual, strengthened by a chitinous rod, with which is connected distally a spoon-shaped plate acting as a valve to close the branchial aperture. Beyond this the tubular portion is formed by a broad and very long strip of transparent membrane rolled up into a spiral with numerous coils "telescoped" into each other. This membrane is marked along its length by parallel striæ or plications, which form a complex spiral pattern when it is rolled up. When fully extended the siphon projects beyond the branchial aperture for a distance equal to at least twice the width of the anterior part of the carapace; when the coils are closed together it forms a short cone protruding from the opening. Very often in the preserved specimens the siphons are unequally extended on the two sides.

The second maxillipeds have the basis shorter than the remaining segments together. The basal plate bears four long setæ on its distal edge and one short seta externally.

The third maxilliped has the basis rather sharply bent, the proximal part being about half as long again as the distal measured along the inner edge. It is produced externally beyond the articulation of the ischium into a pointed lobe, which is nearly two-thirds as long as the segment itself and which bears a row of plumose setæ on its inner edge and another on its lower surface. The merus is about half as long as the ischium along its inner edge and is expanded externally into a very large curved lobe, bearing a long feathered seta at its tip. The terminal segment is very small, little more than half the length of the preceding.

The first legs have the penultimate segment extending a little beyond the pseudo-rostrum. The basis is about two-thirds as long as the remaining segments together, with a small tooth at the distal end of its outer edge and a long plumose seta internal to it. The terminal segment is about half the length of the preceding.

The second legs are stout and not shorter than the succeeding pair. They have all seven segments distinct. The basis is a little shorter than the remaining segments together. The carpus and propodus are short and subequal, and together equal the ischium in length. The terminal segment is longer than the ischium, about three times as long as broad, and armed distally with three long and some shorter spines.

The remaining pairs of legs diminish in length posteriorly, the basis of the last pair being not much more than half as long as that of the third pair.

The uropods are slender, the peduncle slightly curved and longer by one-third than the last somite. The exopod is nearly three-fifths of the length of the peduncle and terminates in two unequal spines; its inner edge bears one or two long feathered setæ. The endopod is three-fourths as long as the exopod, composed of two segments, the distal little more than one-third of the length of the proximal; it terminates in a long spine and has three short spines on its inner edge.

Adult Male.—Total length 2.7 mm.

The carapace is about one-fourth of the total length, its vertical height less than two-thirds of its length. Seen from the side it differs from that of the female in having the dorsal outline less strongly arched and not elevated at the posterior end. The ridges on the side of the carapace are only faintly indicated and the surface is smoother than in the female. The ocular lobe is much larger and more prominent. The eye is deeply pigmented and not completely separated into two portions; nine large corneal lenses are visible from above.

The first and second leg-bearing somites are subequal in height and much lower than the posterior part of the carapace.

The abdominal somites are much stouter than in the female, with well-marked pleural plates fringed with rather long hairs posteriorly.

The antenna is of the usual structure and its flagellum is equal in length to the body.

The branchial apparatus differs greatly from that of the female, having about nine very broad lamellar lobules, increasing in size posteriorly and each truncate at the tip. The branchial siphon is similar to that of the female.

The first leg has the basis longer than in the female, about equal in length to the remaining segments together.

The pleopods are of the usual structure.

The peduncle of the uropods is a little shorter than in the female and the exopod is a little more than three-fifths of its length. The inner edge of the peduncle has a fringe of feathered setæ. The endopod has six spines on the inner edge.

Remarks.—The two long branchial siphons projecting from the anterior corners of the head give this species a very remarkable appearance and distinguish it at once from any Cumacean hitherto described. Apart from the branchial system, however, its structure does not seem to be in any way unusual.

The separation of the two branchial siphons, though nowhere else so marked, will, I

believe, be found to be not uncommon among the Cumacea. Sars describes (Crust. Norway, iii. p. 6) the anterior part (exopod) of the branchial apparatus as uniting with its fellow of the opposite side to form "a funnel-shaped tube," and in his description of *Nannastacus longirostris* (Arch. Math. Naturvid. iv. p. 122) he states that this species differs from all other Cumacea in having two distinct siphons. This is a point which is very difficult to determine in preserved specimens, especially if the dissection has to be directed to the examination of other characters as well, but I have observed it in Cumacea belonging to widely distinct families and am inclined to suspect that it may even prove to be the rule. I hope to return to this point on a future occasion.

Occurrence.—Gulf of Siam, "Between Koh Mesan and Cape Liant, 5-9 fathoms," "Koh Kam, 5-10 fathoms." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum. A solitary young specimen was obtained by Prof. Herdman in the Gulf of Manaar and is referred to in my Report on his collection (Rep. Ceylon Pearl Fisheries, Royal Society, pt. ii. (1904), Suppl. Rep. xii. Cumacea, p. 160) as "*Bodotriidæ* n. g. and sp."

IPHINOË sp.

Two immature specimens of a species of this genus, the larger only 4.4 mm. in length, are in the collection from the Gulf of Siam. In having the carapace more than twice as long as deep they differ from all the species hitherto described except *I. serrata* Norman (non Sars) and *I. brevipes* Hansen. The latter has the carapace three times as long as deep, and differs widely in many other characters. With *I. serrata* the present specimens agree in having a series of teeth on the outer edge of the basis of the first pair of legs. In co-typical specimens of Norman's species the carapace is two and a half times as long as deep, but in a specimen from the Mediterranean which I refer to this species the proportion approaches that of the Siamese specimens, where it is about two and a fifth. Other characters, such as the longer last segment of the antennular peduncle and the shorter and stouter uropods, may perhaps be due to the immaturity of these very small specimens, to which, for the present, I prefer not to assign a specific name.

Occurrence.—Gulf of Siam, "Koh Kam, 10 fathoms, 4/2/00," "Between Koh Mesan and Cape Liant, 5-8 fathoms, 7/2/00." Th. Mortensen Coll., Copenhagen Museum.

Family VAUNTOMPSONIIDÆ.

Dr. H. J. Hansen has suggested (Isopoden, Cumaceen, &c. der Plankton-Expedition, p. 57) that this family ought probably to be united with the preceding. I have also discussed some facts pointing in the same direction (Cumacea of Siboga Exp. p. 8). For convenience, however, the name is here retained pending a general reconsideration of the classification of the Cumacea.

VAUNTOMPSONIA CRISTATA Spence Bate.

Vauntompsonia cristata G. O. Sars, Arch. Math. Naturvid. iv. p. 13, pls. xxiii.-xxvi. (1879); Calman, Fisheries, Ireland, Sci. Invest. 1904, i. (1905), p. 17, pl. i. fig. 1.

To this species I refer, not without some hesitation, a number of male specimens from the West Indies. They differ from British and Mediterranean specimens in their much smaller size (not exceeding 3, as against 5 mm.), but no differences of structure can be detected by a careful examination except that the peduncle of the uropods is relatively shorter and thicker, being shorter than the exopod and less than four times as long as thick.

Occurrence.—"Cruz Bay, St. Jan" (Danish West Indies), "Chr. Levinsen, 6/1/96." About twenty specimens, all males. Copenhagen Museum.

VAUNTOMPSONIA ARABICA, sp. n. (Plate VII. figs. 20-24.)

Description of adult Male.—Total length 3.1 mm.

The carapace is distinctly more than one-fourth of the total length, its vertical height about two-thirds of its length. Seen from the side the dorsal edge is distinctly arched. Pseudorostrum very short and truncated. Anterior edge without teeth. Antero-lateral angle obtuse, with a single inconspicuous denticle.

The anterior lobe of the fifth leg-bearing somite is broader, and the notch defining it above is less distinct than in *V. cristata*.

The abdomen is about equal in length to the cephalothoracic region and is stouter than in *V. cristata*.

The antennules have the peduncle shorter and stouter than in *V. cristata*, the second segment is without the stout setæ present in the male of that species, and the third segment is longer than the second.

The third maxilliped has the basis without serrations on its inner edge.

The first legs are considerably shorter than in *V. cristata*, extending beyond the pseudorostrum by little more than the length of the terminal segment. The basis is two-thirds of the length of the distal segments together. The dactylus is two-thirds as long as the carpus and little more than half the length of the propodus.

The second legs have the basis about equal to the distal segments; the last segment is less than four times as long as broad and not longer than the two preceding segments. The posterior legs, and especially their basal segments, are relatively shorter than in *V. cristata*.

The uropods have the peduncle equal in length to the terminal somite and rather less than four times as long as thick, with eight subequal spinules and a longer distal one on its inner edge. The exopod is equal to the peduncle, with three minute spines on its outer edge, one long and two short spines terminally and one small spine on the inner edge. The endopod extends beyond the exopod by half the length of its distal

segment. The proximal segment has about ten subequal spines and a stronger distal one on its inner edge, and a minute distal spinule externally. The distal segment has one long and two short terminal spines and a small spinule on the inner edge.

The pigmentation is variable; patches are generally present on the back and sides of the carapace, and some specimens have dendritic spots on the sides of the abdominal somites.

Remarks.—This species is very closely allied to *V. cristata*, but it appears to differ in a number of small characters, of which the convex dorsal edge of the carapace and the shorter first legs are the most conspicuous.

Occurrence.—"Suez Canal, 31/1/98, H. Mortensen"; "Aden, 2/98, H. Mortensen." Copenhagen Museum. Co-types in British Museum.

LEPTOCUMA KINBERGII G. O. Sars.

Leptocuma kinbergii G. O. Sars, Kongl. Svenska Vet.-Akad. Handl. ii. no. 5, p. 24, pl. vi. (1873).

The specimen which I refer to this species is a female with developing but empty brood-pouch. It measures 22.5 mm. in length of body, and is thus more than half as long again as Sars's immature specimen. It differs from the latter in the following particulars:—

The carapace is less deep, its vertical depth being less than two-thirds of its length, its lower edge is less convex, and the antero-lateral margin as seen from the side is proportionately deeper. The ocular lobe reaches quite to the tip of the pseudorostrum, and the dorsal edge of each lateral plate, where it lies against the ocular lobe, is convex instead of concave. The antennal notch is much shallower than in Sars's figure. The pleural plates of the third free thoracic somite are produced backwards on each side as large rounded lobes, and those of the fourth somite are similarly but less strongly produced, while the last thoracic and the first four abdominal somites have the lower hinder corner slightly produced. The appendages, so far as they are preserved and can be seen without dissection, agree in general with those of Sars's specimen. The second leg, however, appears to be longer, reaching as far as the anterior margin of the carapace in the natural position. The posterior legs are somewhat shorter and more robust. The uropods differ from the figure given by Sars in having setæ on the outer edge of both segments of the endopod, and in having the distal segment little shorter than the proximal, while in Sars's figure it is about two-thirds of that length.

In view of the much smaller size and the immaturity of the type-specimen, the characters in which it differs from the present specimen cannot be regarded as of specific value.

Occurrence.—"Magelbæ's Strædet, Schythe." Copenhagen Museum. 1 specimen.

Family LEUCONIDÆ.

The new genera which are described below render necessary some important modifications in the definition of this family. While all the forms hitherto described agree in having exopods on the first three pairs of legs in the female and on the first four in the male, and in having two pairs of pleopods in the latter sex, the species now described from New Zealand show that the thoracic exopods may be reduced to two pairs in both sexes, and the male pleopods may be present as a single pair or altogether absent. Further, the division of the endopod of the uropods into two segments may be indistinct or suppressed.

The fact that, in some of the species, the ischium of the second pair of legs is distinctly developed (as in Zimmer's *Pseudoleucon*) cannot be made use of as a generic character, since *Heteroleucon akaroënsis* and *Leucon* (?) *heterostylis* present an intermediate condition in which the segment in question is developed only as a very narrow and incomplete ring of chitin between the basis and merus. I find the same structure in *Leucon nasica* Krøyer, *L. assimilis* Sars, and *L. longirostris* Sars, and possibly this vestigial segment has been overlooked in other members of the genus. I cannot identify it, however, in the species of *Eudorella* and *Eudorellopsis* which I have examined. It is noteworthy that the disappearance of the segment is thus shown to be due to "excalation," not, as Sars says (Crust. Norway, iii. p. 29), to fusion with the merus.

In other respects, especially in the structure of the mouth-parts, the new forms agree with the Leuconidæ already known. The inconvenience of genera distinguished only by the characters of one sex is sufficiently obvious, and indeed, in the case of one of the species described below, I have been unable to decide as to its proper generic position owing to the fact that no male specimens were found. Apart, however, from the frequent use of such distinctions in other groups of animals, a precedent is afforded among the Cumacea by Sars's genus *Hemilamprops*, which is distinguished from *Lamprops* only by the characters of the male.

The following key will serve to indicate the position which the new genera occupy relatively to the other genera of the family:—

A. First three pairs of legs in female and first four in male carry exopods.

a. Two pairs of pleopods in male.

a. Antennules not geniculate *Leucon* Krøyer.

b. Antennules geniculate between second and third segments of peduncle *Eudorella* Norman.

c. Antennules geniculate between first and second segments of peduncle.

a'. Pseudorostrum obsolete or short, vertical, and truncated . . . *Eudorellopsis* Sars.

b'. Pseudorostrum long, oblique, and acute. *Pseudoleucon* Zimmer.

- b. One pair of pleopods in male *Paraleucon*, g. n.
 c. No pleopods in male *Hemileucon*, g. n.
 B. First two pairs of legs only carry exopods in both sexes. No pleopods
 in male *Heteroleucon*, g. n.

LEUCON (?) HETEROSTYLIS, sp. n. (Plate VIII. figs. 1-5.)

Description of adult Female.—Total length 3.42 mm.

Carapace a little over one-fifth of total length, its vertical height less than two-thirds of its length. The dorsal edge is nearly straight, coarsely and somewhat irregularly serrated in the anterior half, with a small denticle near the posterior end and in front of it a shallow depression. Pseudorostrum straight, horizontal, acute, measuring along its upper edge about one-fourth of the total length of the carapace. The antennal notch forms a deep rounded sinus in the antero-lateral margin, which, above the notch, is cut into about four coarse teeth. On the antero-lateral corner begins a series of strong acute teeth, diminishing to faint serrations on the lower margin. The side of the carapace is smooth. The abdomen is longer than the cephalothoracic region and stout, the first two somites being not longer than broad.

The antennules have the first segment of the peduncle longer than the second, which is again a little longer and stouter than the third. The outer flagellum is a little longer than the last segment of the peduncle and is composed of three segments, the first and second subequal and the third minute. The inner flagellum is unsegmented and is nearly equal to the first two segments of the outer flagellum together. The antennæ are composed of three segments, the basal one bearing three plumose setæ.

The branchial apparatus has two small papilliform lobules on its posterior part.

The first legs are imperfect in all the specimens examined.

The second legs have the ischium represented by two very narrow semiannular sclerites interposed between the basis and merus, forming a ring which is interrupted on the inner and outer sides.

The uropods have the peduncle longer than the last somite and about three times as long as broad. The rami are very unequal, the exopod being shorter than the peduncle and little more than half the length of the endopod. The latter is composed of two segments, the proximal two and a half times as long as the distal. There are about ten slender spines on the inner edge and two unequal spines at the tip, while the outer edge bears a series of stout setæ. The exopod bears a series of long setæ on the inner edge and at the tip and some short setæ on the outer edge.

Remarks.—In the absence of the male it is impossible to decide whether this species ought to be referred to some of the new genera defined below. Its resemblance, however, in such characters as the shape of the antero-lateral edge of the carapace, to *L. longirostris* Sars leads me to believe that it will be found to belong to the genus

Leucon. In that case it will fall into the group of species which have a large inner flagellum on the antennule. From all the species of this group it is distinguished by having the outer rami of the uropods shorter than the first segment of the inner.

Occurrence.—"Akaroa Harbour, S, 97, 6 fathoms, H. Suter." Copenhagen Museum.

EUDORELLA TRUNCATULA (Spence Bate).

Eudorella truncatula G. O. Sars, Crust. Norway, iii. p. 37, pl. xxix. (1900).

I am unable to find any differences of importance by which to distinguish three New Zealand specimens from North Atlantic specimens of this species. They are of small size, an ovigerous female measuring only 2.75 mm. in total length. The armature of the antero-lateral margin of the carapace resembles that found in *E. truncatula* and in *E. pusilla* (the distinctness of these two species appears to me doubtful), but the tooth of the antero-lateral angle is a little more prominent, though much less so than in *E. nana* or *E. hispida*. The second legs have the basis not much shorter than the remaining segments together, and the merus and carpus relatively shorter than in northern specimens of *E. truncatula*. The terminal spine of the endopod of the uropods is also somewhat stronger.

Occurrence.—"Akaroa Harbour, H. Suter Coll., S/97." 3 specimens. Copenhagen Museum.

EUDORELLOPSIS RESIMUS, sp. n. (Plate VIII. figs. 6-10.)

Description of adult Female.—Total length 1.75 mm.

General form much as in *E. deformis* (Kröyer). Pseudorostrum well-marked, directed upwards with a slight inclination forwards, distal end truncated, posterior corner not produced, length along posterior edge about one-fourth of total length of carapace. Posterior part of dorsal edge of carapace carrying a prominent tooth directed obliquely forwards. Antero-lateral edge coarsely serrated, the teeth becoming lower and more irregular on the upper part, lower part curving backwards and ending in a small tooth defining the antennal notch. The side of the carapace bears, above the middle of its height, a longitudinal ridge which curves upwards to the anterior edge of the pseudorostrum.

The antennules are more slender than in *E. deformis* and bear less numerous spines. The outer flagellum, composed of three segments, is shorter than the last segment of the peduncle. The unjointed inner flagellum is equal in length to the first segment of the outer.

First legs short, reaching beyond the anterior end of the carapace by not more than the length of the last segment, less richly setose than in *E. deformis*. Second legs also short, with carpus half as long as merus and equal to propodus.

Uropods short and stout, peduncle about two-thirds as long as the last somite.

Exopod nearly twice as long as the peduncle, roughened on its outer surface with irregular tubercles or blunt teeth, with two unequal spines at the tip and a single seta on the inner edge. Endopod only a little shorter than the exopod; first segment twice as long as the second, the latter with a long stout terminal spine and a smaller one internal to it, inner edge unarmed.

Remarks.—This species differs from the two species of the genus already known in having the pseudorostrum produced vertically and in possessing a lateral longitudinal ridge on the carapace. In the large size of the pseudorostrum it approaches the genus *Pseudoleucon* of Zimmer, and suggests that that genus should not be separated from *Eudorellopsis*.

Occurrence.—"Lyttleton Harbour." 1 specimen. Copenhagen Museum.

Genus HETEROLEUCON, gen. nov.

Only the first and second pairs of legs have exopods in either sex. The endopod of the uropods is unsegmented. The male has no pleopods.

Type species *H. akaroënsis*, sp. n.

The general form of the body is that of the genus *Leucon*, the carapace having a prominent pseudorostrum and a serrated dorsal crest (in the female). The very oblique pseudorostrum recalls the genus *Pseudoleucon* of Zimmer, from which, however, the present form is distinguished by the fact that the peduncle of the antennules is not sharply geniculate between the first and second segments.

HETEROLEUCON AKAROËNSIS, sp. n. (Plate VIII. figs. 11-23.)

Description of adult Female.—Total length 2.75 mm.

Carapace a little less than one-fourth of total length, compressed, its vertical height about two-thirds of its length. The dorsal edge is slightly arched as seen from the side, keeled, serrated in its anterior half with eight to ten teeth, and with a single larger tooth just in front of the posterior margin. In front of the posterior tooth there is generally a shallow rounded excavation of the dorsal edge, but in some cases this is less marked than in the specimen figured. The pseudorostrum is straight, directed obliquely upwards, and sharply pointed. The length of its upper edge is a little less than one-third of the length of the carapace. The antennal notch forms a, rather shallow rounded sinus in the antero-lateral margin, which has one or two teeth above the notch and below it is coarsely serrated and curves backwards into the lower margin without any distinct antero-lateral angle.

The abdomen is rather stout and is a little shorter than the cephalothoracic region.

The antennules have the first two segments of the peduncle very stout and subequal, the third only half the diameter of the second and two-thirds of its length. The

outer flagellum is about equal to the second segment of the peduncle and consists of two segments. The unjointed inner flagellum is equal in length to the first segment of the outer.

The antennæ are composed of three segments. The proximal segment bears two plumose setæ.

The mouth-parts are of the usual Leuconid type.

The posterior division of the branchial apparatus bears only two small papilliform lobules.

The first legs extend beyond the pseudorostrum by nearly the length of their two distal segments. The basis is about two-thirds as long as the distal segments together.

The second legs have the basis shorter than the remaining segments together; the ischium is represented by a narrow chitinous ring between the basis and merus.

The uropods have the peduncle longer than the terminal somite and about three times as long as thick. The rami are subequal and a little longer than the peduncle. The exopod is obliquely truncated at the tip, which bears about five unequal setæ. The endopod has a strong, dorsally curved, apical spine and about ten spines on its inner edge.

Description of adult (?) Male.—Total length 1.65 mm.

Carapace one-fourth of total length, its vertical height about four-fifths of its length. Dorsal edge slightly arched, smooth, or with one or two small serrations anteriorly. Pseudorostrum very short, horizontal, broadly rounded at the tip. No antennal notch. Antero-lateral angle broadly rounded and serrated.

Antennules with three segments in outer flagellum.

Antennæ with flagellum very short, not longer than the peduncle, composed of nine segments. It is thickened at the base, where the segments are indistinctly separated, but distally they are slender and well-formed and provided with sensory setæ.

The remaining appendages do not differ greatly from those of the female.

The peduncle of the uropods is little more than half the length of the rami.

Remarks.—Though there can be little doubt that the males described above belong to the same species as the females, their much smaller size is very suggestive of immaturity, and to this cause may be due the remarkable shortness of the antennæ. The antennæ, however, do not show the usual characters of immaturity, for the peduncle is beset with sensory filaments, and the flagellum, though short, is distinctly segmented and carries setæ.

Occurrence.—"Akaroa Harbour, 6 fathoms, H. Suter Coll., 8/97": many females and three males. "Lyttleton Harbour, 1-5 fathoms, H. Suter Coll., 8/97": many females. Copenhagen Museum. Co-types in British Museum.

Genus *PARALEUCON*, gen. nov.

Differing from *Leucon* in having only one pair of pleopods in the male sex.

Type species *P. suteri*, sp. n.

The species described below resembles *Heteroleucon akaroënsis* in the arrangement of the teeth on the dorsal crest of the carapace. The segmentation of the endopod of the uropods is much less distinct than in most other Leuconidæ, and may be regarded as forming a transition to the unsegmented condition found in *Heteroleucon*. The number of thoracic exopods, however, and the presence of a pair of pleopods in the male seem to require that this species should be distinguished generically from the last.

PARALEUCON SUTERI, sp. n. (Plate IX. figs. 1-20.)

Description of adult Female.—Total length 2.9 mm.

Carapace more than one-fifth of total length, compressed; its vertical height a little more than two-thirds of its length. The dorsal edge is nearly straight as seen from the side, keeled, with a large tooth near the hind margin overhanging a rounded excavation, in front of which the dorsal keel bears a varying number of irregular serrations. The pseudorostrum is straight, directed obliquely upwards, and sharply pointed. The length of the upper edge is less than one-fourth of the total length of the carapace. The antennal notch is well-marked and angular, defined below by a triangular tooth, below which the anterior part of the lower margin is obscurely serrated. On the side of the carapace are three subparallel ridges curving obliquely downwards and forwards.

The abdomen is longer than the cephalothoracic region.

The antennules have the first segment of the peduncle little stouter than the second and shorter than the second and third together. The outer flagellum is composed of three segments and is shorter than the third segment of the peduncle. The inner flagellum is unsegmented and about equal to the first segment of the outer.

The antennæ are composed of three segments. The proximal segment bears two plumose setæ.

The mouth-parts are of the usual Leuconid type. The maxillæ have two or three small setæ on the distal part of the inner edge.

The branchial system is reduced, the lobules being represented only by two small papillæ.

The first legs extend beyond the pseudorostrum by little more than the length of their last segment. The basis is little shorter than the remaining segments together, and the dactylus is nearly as long as the propodus. The exopod is shorter than the basis.

The second legs have the ischium distinct and the dactylus longer than the carpus.

The uropods have the peduncle a little longer than the last somite and about $3\frac{1}{2}$ times as long as thick, with one or two minute setæ on its inner edge. The endopod is about $1\frac{1}{4}$ times as long as the peduncle, somewhat indistinctly divided into two subequal segments, with about 12 spines on its inner edge and two unequal terminal spines. The exopod is longer than the endopod, with a slender terminal spine and a series of setæ on its inner edge.

Description of adult Male.—Total length 2.4 mm.

Teeth of dorsal crest of carapace in some specimens only a little less marked than in the female, in others almost obsolete. Pseudorostrum horizontal, truncated, about one-sixth of total length of carapace. No antennal notch or tooth, the antero-lateral corner rounded off, with a few obscure serrations. Only two oblique ridges on the side of the carapace, corresponding to the two posterior ridges of the female.

The antennules have the second and third segments of the peduncle shorter than in the female, and together shorter than the first segment. The flagella are similar to those of the female.

The antennæ have the penultimate segment of the peduncle more than one-half as long as the succeeding segment. The flagellum is very short, not more than twice as long as the peduncle, and not extending back beyond the first free thoracic somite in the natural position.

Exopods are present on all except the last pair of legs.

Only the first abdominal segment has appendages and these are of very small size. The peduncle is twice as long as broad and bears two minute unjointed rami. Each ramus has a single long plumose seta, and the outer bears in addition one or two short simple setæ.

The uropods hardly differ from those of the female, having only a few additional small setæ on the inner edge of the peduncle.

Occurrence.—"Lyttleton Harbour, 5/97, 1-5 fathoms, H. Suter"; "Akaroa Harbour, 8/97, 6 fathoms, H. Suter." Copenhagen Museum. Co-types in British Museum.

HEMILEUCON, gen. nov.

Differing from *Leucon* and *Paraleucon* in having no pleopods in the male sex.

Type species *H. uniplicatus*, sp. n.

HEMILEUCON UNIPLICATUS, sp. n. (Plate IX. figs. 21-25.)

Description of adult Female.—Total length 2.6 mm.

Carapace about one-fourth of total length, its vertical height a little more than two-thirds of the length. The dorsal crest is slightly arched, its anterior half serrate. Pseudorostrum straight, slightly upturned, obliquely truncate; the length of its

upper edge is less than one-fourth of the total length of the carapace. The antennal notch is well marked, defined below by a triangular tooth. The antero-lateral margin above the notch bears three or four serrations, and the front part of the lower margin is serrated. The side of the carapace is marked by a single horizontal ridge above the middle of its height, curving upwards posteriorly to join the hind margin, and terminating anteriorly below the end of the frontal fissure.

Antennules with the outer flagellum of three segments, the inner of one, equalling the first segment of the outer.

The legs, so far as they are visible without dissection, present no marked differences from those of *Paraleucon*.

The uropods have the peduncle a little longer than the terminal somite and three times as long as thick. The rami are subequal and $1\frac{1}{2}$ times as long as the peduncle. The endopod is distinctly segmented, the proximal $1\frac{1}{2}$ times as long as the distal segment. The terminal spine is not much longer than the distal spine of the inner edge. The exopod has several unequal setæ at and near the tip.

Description of adult Male.—Total length 2.35 mm.

Dorsal edge of carapace slightly arched, with only some faint traces of serration anteriorly. Pseudorostrum horizontal, truncated, less than one-fifth of total length of carapace. No antennal notch or tooth, the antero-lateral corner rounded off, the antero-lateral edge serrated from the base of the pseudorostrum to the lower edge. The side of the carapace bears a horizontal ridge similar to that of the female.

The antennæ have a very short flagellum and hardly reach back to the hind margin of the carapace in the natural position.

Exopods are present on all except the last pair of legs.

The uropods resemble those of the female.

Occurrence.—"Lyttleton Harbour, 5/97, 1-5 fathoms, H. Suter"; "Akaroa Harbour, 8/97, 6 fathoms, H. Suter." Copenhagen Museum.

HEMILEUCON COMES, sp. n. (Plate IX. figs. 26-32.)

Description of adult Female.—Total length 2.8 mm.

Carapace less than one-fourth of total length, its vertical height less than two-thirds of its length. Dorsal crest very slightly arched, irregularly serrate anteriorly, with a depression near the posterior end. Pseudorostrum straight, directed obliquely upwards, sharply pointed. The length of its upper edge is about one-third of the total length of the carapace. Antennal notch rather widely open, defined by a triangular tooth, the lower edge of which is obscurely serrated. The side of the carapace bears two oblique ridges similar in position to, though less strongly marked than the two anterior ridges of *Paraleucon*.

Abdomen hardly longer than the cephalothoracic region.

Antennules as in *H. uniplicatus*.

The first legs are imperfect in the specimens examined. The second legs have the ischium distinct. The dactylus is equal to the merus and carpus together.

The uropods have the peduncle longer than the last somite and about $3\frac{1}{2}$ times as long as thick. The endopod is longer than the peduncle and shorter than the exopod, and is distinctly divided into two segments, the proximal less than $1\frac{1}{2}$ times as long as the distal. There are about nine spines on the inner edge, increasing in length towards the slender terminal spine. The exopod has two unequal terminal setæ and series of setæ on the inner and outer edges.

Description of adult Male.—Total length 2.7 mm.

Dorsal edge of carapace slightly arched, smooth. Pseudorostrum horizontal, truncated, about one-sixth of total length of carapace. No antennal tooth or notch, antero-lateral corner rounded, no serrations on antero-lateral or lower edges. The side of the carapace bears two oblique ridges similar to, but fainter than, those on the carapace of the female.

The antennæ have the flagellum short, reaching to about the second free thoracic somite in the natural position.

Exopods are present on all except the last pair of legs.

The uropods resemble those of the female.

Occurrence.—"Lyttleton Harbour, 5/97, 1-5 fathoms, H. Suter." Copenhagen Museum.

PLATE I.

PLATE I.

- Fig. 1. *Bodotria sublevis* (p. 3). Female. Anterior part of body.
 2. " " " First leg.
 3. " " " Last somite and uropod.
 4. " *similis* (p. 4). Female.
 5. " " Male.
 6. " " Female. Carapace.
 7. " " " First leg.
 8. " " " Last somite and uropod.
 9. " " Male. Last somite and uropod.
 10. " *siamensis* (p. 5). Female.
 11. " " Male.
 12. " " Female. Carapace.
 13. " " " First leg.
 14. " " " Last somite and uropod.
 15. " " Male. Last somite and uropod.
 16. " *parva* (p. 5). Female. Carapace.
 17. " " " First leg.
 18. " " " Last somite and uropod.

PLATE II.

PLATE II.

Fig. 1.	<i>Cyclaspis elegans</i> (p. 9).	Female.	From the side.
2.	„ „	Male.	From the side.
3.	„ „	Female.	From above.
4.	„ „	Male.	From above.
5.	„ „	Young,	before development of last pair of legs.
6.	„ „	Young male	with developing pleopods.
7.	„ „	Female.	Anterior part of head, from above.
8.	„ „	„	Antennule and antenna.
9.	„ „	„	Antenna, another view.
10.	„ „	Male.	Antennule.
11.	„ „	„	Antenna.
12.	„ „	Female.	Lower lip.—12 <i>a</i> . Tip of one of the lobes, further enlarged. 12 <i>b</i> . One of the spathulate spines.
13.	„ „	„	Maxillula.
14.	„ „	„	First maxilliped with branchial apparatus.—14 <i>a</i> . Endopod of same, further enlarged.
15.	„ „	„	Second maxilliped.
16.	„ „	„	Third maxilliped.
17.	„ „	„	First leg.
18.	„ „	„	Second leg.
19.	„ „	„	Third leg.
20.	„ „	„	Fourth leg.
21.	„ „	„	Fifth leg.
22.	„ „	Male.	Pleopod.
23.	„ „	Female.	Last somite and uropods.
24.	„ „	Male.	Last somite and uropods.



PLATE III.

PLATE III.

- Fig. 1. *Cyclaspis similis* (p. 12). Female. From the side.
 2. „ „ „ From above.
 3. „ „ „ Last somite and uropods.
 4. „ *biplicata* (p. 17). Female. From the side.
 5. „ „ Male. From the side.
 6. „ „ Female. Anterior part of body, from above.
 7. „ „ Male. Anterior part of body, from above.
 8. „ „ Female. Dorsal outline of first free somite.
 9. „ „ Male. Dorsal outline of first free somite.
 10. „ „ Female. Antennule.—10*a*. Distal portion further enlarged.
 11. „ „ „ Antenna.
 12. „ „ „ First leg.
 13. „ „ „ Second leg.
 14. „ „ „ Last somite and uropod.
 15. „ „ Male. Last somite and uropod.
 16. „ *triplicata* (p. 19). Female. From the side.
 17. „ „ Male. From the side.
 18. „ „ Female. Anterior part of body, from above.
 19. „ „ Male. Anterior part of body, from above.
 20. „ „ Female. Dorsal outline of first free somite.
 21. „ „ Male. Dorsal outline of first free somite.
 22. „ „ Female. First leg.
 23. „ „ „ Last somite and uropod.
 24. „ „ Male. Last somite and uropod.

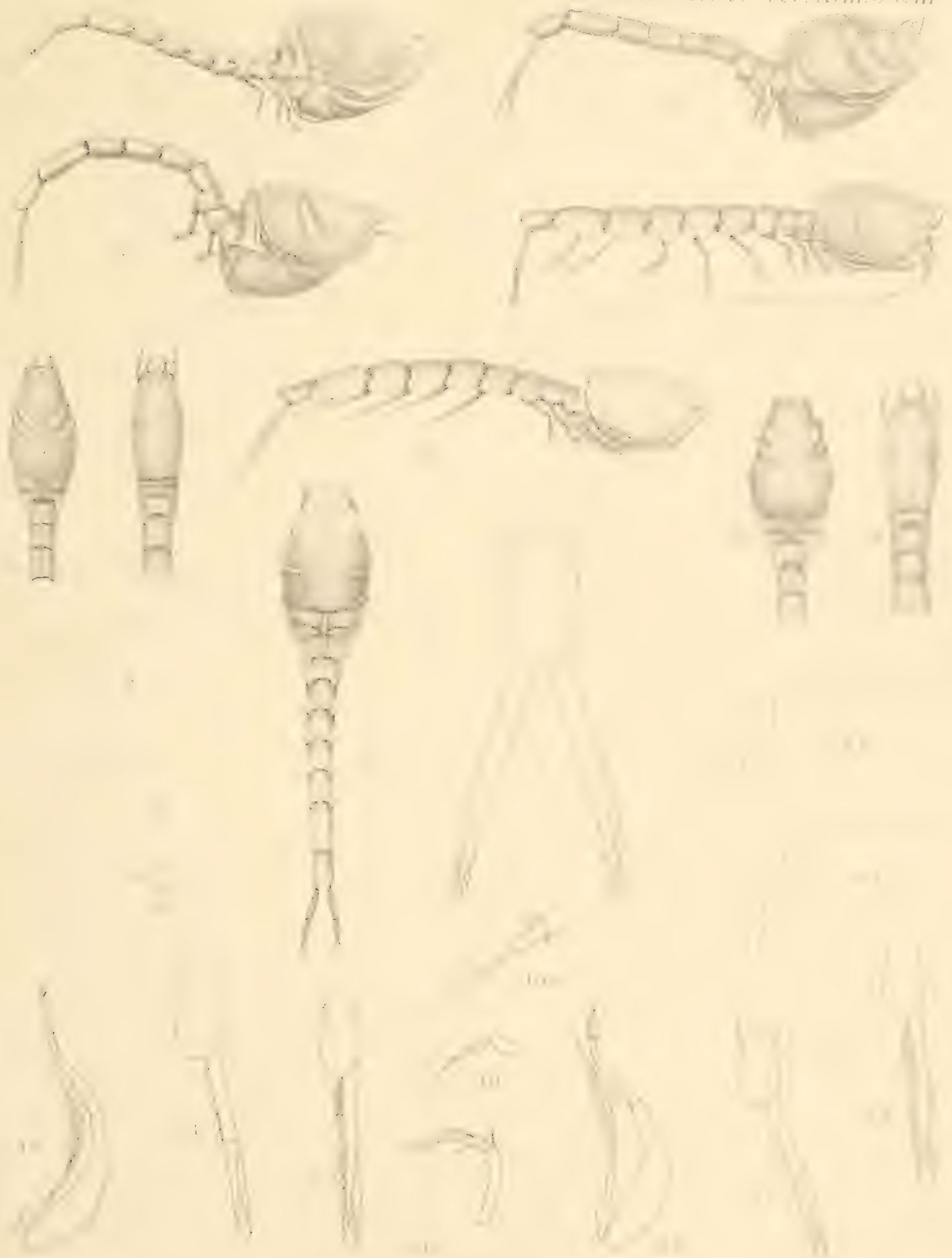


PLATE IV.

PLATE IV.

- Fig. 1. *Cyclaspis cingulata* (p. 15). Female. From the side.
 2. „ „ „ „ From above.
 3. „ „ „ „ Outline of carapace, seen from in front.
 4. „ „ „ „ Anterior part of head, from above.
 5. „ „ „ „ Anterior part of head, from the side.
 6. „ „ „ „ Antennule.
 7. „ „ „ „ Third maxilliped.
 8. „ „ „ „ First leg.
 9. „ „ „ „ Second leg.
 10. „ „ „ „ Last somite and uropod.
 11. „ *uniplicata* (p. 13). Female. From the side.
 12. „ „ „ „ From above.
 13. „ „ „ „ Anterior part of head, from the side.
 14. „ „ „ „ Antennule.
 15. „ „ „ „ Third maxilliped.
 16. „ „ „ „ First leg.
 17. „ „ „ „ Second leg.
 18. „ „ „ „ Third leg.
 19. „ „ „ „ Fifth leg.
 20. „ „ „ „ Last somite and uropod.



PLATE V.

PLATE V.

- Fig. 1. *Cyclaspis longipes* (p. 7). Female. From the side.
 2. „ „ Male. From the side.
 3. „ „ Female. First leg.
 4. „ „ „ Last somite and uropod.
 5. „ „ Male. Last somite and uropod.
 6. „ *levis* (p. 8). Female. From the side.
 7. „ „ „ First leg.
 8. „ „ „ Last somite and uropod.
 9. „ *unicornis* (p. 14). Female. From the side.
 10. „ „ „ First leg.
 11. „ „ „ Last somite and uropod.
 12. „ *thomsoni* (p. 16). Female. From the side.
 13. „ „ Male. From the side.
 14. „ „ Female. First leg.
 15. „ „ „ Last somite and uropod.
 16. „ „ Male. Last somite and uropod.



PLATE VI.

PLATE VI.

- Fig. 1. *Eocuma longicornis* (p. 20). Male. From the side.
 2. „ „ „ „ From above.
 3. „ „ „ „ Antennule.
 4. „ „ „ „ First leg.
 5. „ „ „ „ Second leg.
 6. „ „ „ „ Last somite and uropod.
 7. „ *lata* (p. 22). Female. From the side.
 8. „ „ „ „ From above.
 9. „ „ „ „ Minute texture of carapace, much enlarged.
 10. „ „ „ „ Antennule and antennæ.
 11. „ „ „ „ First leg.
 12. „ „ „ „ Last somite and uropod.
 13. „ *stellifera* (p. 23). Female. From the side.
 14. „ „ „ „ From above.
 15. „ „ „ „ Minute texture of carapace, much enlarged.
 16. „ „ „ „ First leg.
 17. „ „ „ „ Last somite and uropod.
 18. „ *producta* (p. 24). Female. From the side.
 19. „ „ „ „ From above.
 20. „ „ „ „ Last somite and uropod



PLATE VII.

PLATE VII.

- | | | | |
|---------|---------------------------------------|---------|---|
| Fig. 1. | <i>Zygosiphon mortenseni</i> (p. 25). | Female. | From the side. |
| 2. | „ „ | „ | From above. |
| 3. | „ „ | „ | Anterior part of head, from above. |
| 4. | „ „ | Male. | From the side. |
| 5. | „ „ | „ | Anterior part of head, from above. |
| 6. | „ „ | Female. | Antennule. |
| 7. | „ „ | „ | Antenna. |
| 8. | „ „ | Male. | Antenna. |
| 9. | „ „ | Female. | Mandible. |
| 10. | „ „ | „ | First maxilliped, with branchial apparatus. |
| 11. | „ „ | Male. | Posterior part of branchial apparatus. |
| 12. | „ „ | Female. | Second maxilliped. |
| 13. | „ „ | „ | Third maxilliped. |
| 14. | „ „ | „ | First leg. |
| 15. | „ „ | „ | Second leg. |
| 17. | „ „ | „ | Third leg. |
| 16. | „ „ | „ | Fifth leg. |
| 18. | „ „ | „ | Last somite and uropod. |
| 19. | „ „ | Male. | Last somite and uropod. |
| 20. | <i>Vauntomponia arabica</i> (p. 29). | Male. | From the side. |
| 21. | „ „ | „ | Antennule. |
| 22. | „ „ | „ | First leg. |
| 23. | „ „ | „ | Second leg. |
| 24. | „ „ | „ | Last somite and uropod. |



PLATE VIII.

PLATE VIII.

- Fig. 1. *Leucon* (?) *heterostylis* (p. 32). Female. From the side.
 2. „ „ „ „ Carapace, further enlarged.
 3. „ „ „ „ Antennule.
 4. „ „ „ „ Second leg.—4 *a*. Middle part of same from inner side to show reduced ischium.
 5. „ „ „ „ Last somite and uropod.
 6. *Eudorellopsis resinus* (p. 33). Female. From the side.
 7. „ „ „ „ Carapace and antennule, further enlarged.
 8. „ „ „ „ First leg.
 9. „ „ „ „ Second leg.
 10. „ „ „ „ Last somite.
 11. *Heteroleucon akaroënsis* (p. 34). Female. From the side.
 12. „ „ „ „ Carapace.
 13. „ „ „ „ Antennule.) *tr.*
 14. „ „ „ „ Antenna.)
 15. „ „ „ „ Mandible.
 16. „ „ „ „ Maxillula.
 17. „ „ „ „ First maxilliped with branchial apparatus.
 18. „ „ „ „ Third maxilliped.
 19. „ „ „ „ First leg.
 20. „ „ „ „ Second leg.
 21. „ „ „ „ Last somite and uropod.
 22. „ „ „ „ Male. From the side.
 23. „ „ „ „ „ Carapace, antennule, and antenna.



Fig. 1-23. 1-5, *LEUCON* (? *HETEROSTYLIS*). 6-10, *EUDORELIOPSIS* *RESIMUS*. 11-23, *HETEROLEUCON* *AKAROENSIS*.

PLATE IX.

PLATE IX.

Fig. 1.	<i>Paraleucon suteri</i> (p. 36).	Female.	From the side.
2.	„ „	„	Carapace, further enlarged.
3.	„ „	„	Antennule.
4.	„ „	„	Antenna.
5.	„ „	„	Mandible of right side and part of that of left side.
6.	„ „	„	Maxillula.
7.	„ „	„	Maxilla.
8.	„ „	„	First maxilliped with branchial apparatus.
9.	„ „	„	First maxilliped, further enlarged.
10.	„ „	„	Third maxilliped.
11.	„ „	„	First leg.
12.	„ „	„	Second leg.
13.	„ „	„	Fourth leg.
14.	„ „	„	Last somite and uropod.
15.	„ „	Male.	From the side.
16.	„ „	„	Carapace, further enlarged.
17.	„ „	„	Antennule.
18.	„ „	„	Antenna.
19.	„ „	„	Pleopod.
20.	„ „	„	Last somite and uropod.
21.	<i>Hemileucon uniplicatus</i> (p. 37).	Female.	From the side.
22.	„ „	„	Carapace with antennule, further enlarged, showing outline of mandible.
23.	„ „	„	Last somite and uropod.
24.	„ „	Male.	From the side.
25.	„ „	„	Carapace with antennule and antenna, further enlarged.
26.	„ <i>comes</i> (p. 38).	Female.	From the side.
27.	„ „	„	Carapace, further enlarged.
28.	„ „	„	Antennule.
29.	„ „	„	Second leg.
30.	„ „	„	Last somite and uropod.
31.	„ „	Male.	From the side.
32.	„ „	„	Carapace, further enlarged.

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(PLATES XXXII.—XXXVII.)

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Continued on page 3 of Wrapper.

IV. *On New or Rare Crustacea of the Order Cumacea from the Collection of the Copenhagen Museum.*—Part II. *The Families Nannastacidæ and Diastylidæ.*
By W. T. CALMAN, D.Sc., F.Z.S., British Museum (Natural History)*.

(Received November 15, 1909; read January 18, 1910.)

[PLATES XXXII.—XXXVII.]

IN this, the second and concluding part † of a report on Cumacea from the Zoological Museum of Copenhagen, twenty-nine species are dealt with, all except two of which are regarded as new, and three new genera are established. As in the case of the specimens dealt with in Part I., the authorities of the Copenhagen Museum have courteously allowed a selection of those here described to be retained for the British Museum.

List of the Species dealt with in this Paper.

Family NANNASTACIDÆ.

<i>Cumella forficula</i> , sp. n.	Gulf of Siam.
„ <i>clavicauda</i> , sp. n.	West Indies.
„ <i>leptopus</i> , sp. n.	„
„ <i>hispidula</i> , sp. n.	Gulf of Siam.
„ <i>serrata</i> , sp. n.	West Indies.
„ <i>lævis</i> , sp. n.	Gulf of Siam.
<i>Nannastacus lepturus</i> , sp. n.	Suez.
„ <i>zimmeri</i> , sp. n.	Ceylon.
„ <i>gibbosus</i> , sp. n.	Gulf of Siam.
„ <i>reptans</i> , sp. n.	„
„ <i>minor</i> , sp. n.	„
„ <i>tardus</i> , sp. n.	„
„ <i>agnatus</i> , sp. n.	„
<i>Schizotrema depressum</i> , gen. et sp. n.	„
„ <i>bifrons</i> , sp. n.	India.
„ <i>sordidum</i> , sp. n.	Gulf of Siam.
<i>Campylaspis platyuropus</i> , sp. n.	„
„ <i>orientalis</i> , sp. n.	Korea.

* Published by permission of the Trustees of the British Museum.

† For Part I., see Trans. Zool. Soc. xviii. pt. i. No. 1 (1907).

Family DIASTYLIDÆ.

<i>Gynodistylis carinata</i> , gen. et sp. n.	New Zealand.
„ <i>lævis</i> , sp. n.	„
„ <i>costata</i> , sp. n.	Gulf of Siam.
„ <i>bicristata</i> , sp. n.	„ and Japan.
<i>Paradiastylis longipes</i> Calm.	„
<i>Colurostylis pseudocuma</i> , gen. et sp. n.	New Zealand.
<i>Diastylopsis elongata</i> , sp. n.	„
„ <i>crassior</i> , sp. n.	„
<i>Diastylis koreana</i> , sp. n.	Korea.
„ <i>fistularis</i> , sp. n.	Gulf of Siam.
„ <i>insularum</i> Calm.	New Zealand.

It is not pretended that this list, with that published in the first part of the paper, accounts for every specimen in the collections submitted to me. A certain number remain over which may represent undescribed species, but they are solitary, immature, or mutilated specimens, undistinguished by any striking features, and descriptions of them, necessarily incomplete, would only add to the perplexities of future students of the group. In addition, there are a considerable number of male specimens of the genera *Cumella* and *Nannastacus* which, as explained below, have so far defied my efforts to reduce them to systematic order.

In working through this very extensive collection, together with other collections from tropical and southern seas reported on elsewhere, the infrequency with which known species have been recognized has been very striking. We seem to be dealing only with random samples from a very rich and varied fauna, and there can be little doubt that the vast majority of existing species of Cumacea still remain to be discovered. While the group is far more abundantly represented in tropical seas than had been supposed, much more extensive collecting will be necessary before it is possible to compare the number of species with those found in boreal and arctic waters; certainly the warmer seas have nowhere been found, as yet, to yield the enormous numbers of individuals occurring, for instance, in favourable localities on the Norwegian coast; and, as in many other groups of animals, the tropical species are far inferior in size to those from the colder regions of the north.

The manifest imperfections of our knowledge make it useless to attempt at present any general discussion of the geographical distribution of the Cumacea. Provisionally, however, it may be said that the collections hitherto examined show a remarkable preponderance, in the warmer seas, of the Bodotriidæ (especially the genus *Cyclaspis*) and Nannastacidæ (especially *Cumella* and *Nannastacus*) and a paucity of Diastylidæ and Leuconidæ. Further south, in New Zealand, as in the Magellan and other sub-antarctic regions, and in the Antarctic Ocean, the Diastylidæ and Leuconidæ reassert themselves.

From the point of view of the general taxonomy and phylogeny of the Crustacea the results of recent additions to our knowledge of the Cumacea are disappointing. Not one of the new genera which have been described perceptibly extends the group towards any of the adjacent Orders of the Malacostraca. The separation of the branchial orifices in *Zygosiphon* and *Schizotrema* might perhaps be thought to take us a little way back in the direction of the Mysidacea, but it is more likely to be a secondary modification than a primitive character; and although *Ceratocuma* in its free telson and full series of pleopods unites two characters, presumably primitive, not elsewhere found in combination, it is in all other respects a specialized type. The Cumacea still remain a sharply circumscribed group, and although it is as certain as anything of the sort can well be that they have been derived from a Mysidacean-like ancestral form and that their line of descent travelled for some little way along with that of the Tanaidacea and Isopoda (but not, probably, with that of the Amphipoda), none of the intermediate links appear to have survived.

It was to be expected that the classification of the Cumacea, established by Sars almost entirely from a study of northern species, would require modification as a result of the discovery of so many new species from other seas. As usually happens in such cases, the diagnoses of existing families have to be greatly modified if they are to admit the new forms, and the limits between the families become harder and harder to recognize. I have elsewhere proposed the union of the Campylaspidæ with the Nannastacidæ, and have commented on the increasing difficulty of keeping the Vauntompsoniidæ apart from the Bodotriidæ and the Diastylidæ from the Lampropidæ. The new genus *Colurostylis* described below similarly helps to bridge the gap between the Diastylidæ and Pseudocumidæ. In many cases characters hitherto relied on for the separation of families—such as the number of thoracic exopods or of pleopods—have proved to be of not more than generic value, and in the case of some of the species of *Nannastacus* described below I have been led to suspect that the number of thoracic exopods may not be even a specific character. Whether it will be possible to group the genera of the order in a smaller number of natural and sharply defined families is a problem which must be left for the future. It is at least as likely that it will be necessary, as it has been in the case of the Gammaridean Amphipods, to establish a much larger number of families and to be content to define these by more trivial characters. At the present moment, however, any attempt at a re-classification could only be of the most provisional nature, and I have therefore preserved, where possible, the existing families, with such extensions as are necessary to admit the new forms.

In the descriptions which follow, the measurement of "total length" includes the telson (when distinct) but not the uropods. As it is often impossible to straighten out the abdomen without the risk of damage to the specimen, it is difficult to obtain accurate measurements, and the figures given must be regarded only as approximate.

Family NANNASTACIDÆ.

Genus CUMELLA.

In addition to the specimens described below there are in the collection a number of males of this genus, collected, for the most part, by Dr. Mortensen in the Gulf of Siam, which I am unable to identify with any described species or to allot to any of the females found with them. As in the case of the genus *Nannastacus*, I do not attempt to describe these males.

Key to the Species of Cumella (excluding C. molossa Zimmer, not yet figured, but described as closely resembling C. gracillima).

- A. Last somite inflated, longer than the preceding.
 - a. Legs of last pair about as long as carapace, carpus more than twice as long as merus; pseudorostrum long *C. forficula*, sp. n.
 - b. Legs of last pair two-thirds as long as carapace, carpus less than twice as long as merus; pseudorostrum very short *C. clavicauda*, sp. n.
- B. Last somite not inflated, not longer than the preceding.
 - a. Peduncle of uropods more than twice as long as last somite; carpus of last leg more than three times as long as merus.
 - A. Carapace one-fourth of total length; pseudorostrum well-developed; eye absent; antennal flagellum of male not longer than thorax *C. gracillima* Calman.
 - B. Carapace one-third of total length; pseudorostrum very short; eye present; antennal flagellum of male nearly equal to length of body *C. leptopus*, sp. n.
 - b. Peduncle of uropods less than twice as long as last somite.
 - A. Last somite about equal in length to the preceding; carpus of last leg three times as long as merus; peduncle of uropods distinctly shorter than last somite *C. hispida*, sp. n.
 - B. Last somite distinctly shorter than preceding; carpus of last leg less than three times as long as merus; peduncle of uropods about equal to or longer than last somite.
 - a. Carpus of last leg more than twice as long as merus *C. serrata*, sp. n.
 - b. Carpus of last leg less than twice as long as merus.
 - a'. Antero-lateral margin of carapace deeply concave, the lower angle prominent.
 - 1. Third free somite with double dorsal tooth (female) *C. australis* Calman.
 - 2. Third free somite without dorsal tooth *C. pygmaea* G. O. Sars.
 - b'. Antero-lateral margin of carapace straight, the lower angle with a small tooth.
 - 1. Rami of uropods subequal *C. levis*, sp. n.
 - 2. Exopodite of uropods shorter than endopodite *C. limicola* G. O. Sars.

CUMELLA FORFICULA, sp. n. (Plate XXXII. figs. 1-6.)

Description of adult Female.—Total length 1·7 mm.

Carapace a little less than one-third of total length, compressed, its depth more than half of its length. The dorsal edge is sinuous, concave in its posterior part, convex anteriorly, and with a small convexity just in front of the hinder margin; commonly, each of these convexities bears a curved spine, but sometimes only the anterior spine is present. The ocular lobe is prominent on the dorsal surface and the eye is well pigmented. The pseudorostrum is long, directed slightly upwards, and acutely pointed; the lateral plates meet in front of the ocular lobe for a distance greater than the diameter of the lobe. The straight antero-lateral margin slopes backwards and the obtuse antero-lateral angle bears a single minute tooth. The surface of the carapace, as of the rest of the body, bears a number of scattered hairs.

The abdomen is but little shorter than the cephalothoracic region. The last somite is of peculiar form; it is longer than the preceding somite and, as seen from the side, it is inflated, with arched upper and under surfaces; seen from above, it increases in width posteriorly and is produced as a rounded lobe for some distance between the bases of the uropods.

The antennules are slender, resembling in proportions those of *C. limicola*, but the unsegmented inner flagellum is still more minute.

The mouth-parts appear to differ only in trivial details from those of the type of the genus.

The first legs resemble those of *C. limicola*, but have the basis relatively a little shorter, less than two-thirds as long as the remaining segments. In the second legs the basis is a little less than two-thirds as long as the remaining segments, while that of *C. limicola* is distinctly more.

The remaining legs are much more slender and have the carpus more elongated than in *C. limicola*. Those of the last pair are about as long as the carapace and have the carpus more than twice as long as the merus and four-fifths as long as the basis.

The uropods are very short, their greatest length to the tip of the terminal spines being less than that of the last somite. The peduncle is less than half as long as the last somite, tapers a little distally, and is hardly more than twice as long as its greatest width. The rami, especially the endopodites, are curved inwards like the tail-forceps of an earwig. The terminal spines are indistinctly defined from the rami, but to the tip of its spine the endopodite is a little longer than and the exopodite equal to the peduncle. There are two spinules on the inner edge of the endopodite and a few setæ on that of the peduncle.

Adult Male.—Total length 1·85 mm.

The body is a little more slender and elongated than in the female, the depth of the carapace being less than half its length. There are no spines on the carapace and the inequality of the dorsal surface is less marked. The eye is very large, with large and

prominent corneal lenses. The pseudorostrum is shorter than in the female and its upper edge is concave. The antero-lateral margin is very short and the angle has no tooth. The last somite of the abdomen is inflated as in the female. The antennal flagella are nearly or quite as long as the body and the lateral grooves are well-marked on all the abdominal somites except the last.

The proportions of most of the appendages are much as in the female, but the uropods are longer; their length to the tip of the terminal spines is greater than that of the last somite. The peduncle is more than half as long as the last somite and nearly three times as long as its greatest width. There are four spinules on the inner edge of the endopodite and five spinules interspersed with fine setæ on that of the peduncle.

Occurrence.—Gulf of Siam, "Koh Kam, 5–10 fathoms, 4–6/2/00," "Between Koh Mesan and Cape Liant, 5–8 fathoms, 7/2/00," "North side of Koh Chang, 1 fathom, 3/3/00." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

CUMELLA CLAVICAUDA, sp. n. (Plate XXXII. figs. 7–10.)

Description of adult Male.—Total length 1.9 mm.

Carapace less than one-third of total length, its depth more than half of its length. Dorsal edge slightly sinuous, without spines. The eye is very large, with about nine large corneal lenses, of which one is in the middle line in front; in all the specimens examined the eye-pigment is aggregated into a pair of small lateral spots, so that under a low magnification the eye appears to be paired and the animal is apt to be mistaken for a species of *Nannastacus*. The pseudorostrum is very short, the lateral plates hardly meeting, if at all, in front of the ocular lobe and forming a pair of small tooth-like prominences when the carapace is viewed from above. The antero-lateral margin is short and nearly straight and the angle is rounded off. As in *C. forficula*, the last abdominal somite is longer than the preceding and inflated as seen from the side; seen from above it increases in width posteriorly, but the hinder edge is broadly convex and hardly produced between the bases of the uropods. The lateral groove is distinct only on the first four abdominal somites and the antennal flagellum is of a corresponding length.

The antennules have the peduncle shorter and stouter than in *C. forficula*, the inner flagellum minute and unsegmented.

The basis of the first legs is much more than two-thirds as long as the remaining segments.

The posterior legs are relatively short; those of the last pair are little more than two-thirds as long as the carapace and have the carpus about one and a half times as long as the merus and little more than half as long as the basis.

The uropods are similar to those of *C. forficula*. The greatest length to the tip of the terminal spine is about one-third more than that of the last somite. The peduncle

is about two-thirds as long as the last somite and not much more than twice as long as its greatest width. The endopodite is not quite so much curved as in *C. forficula* and the exopodite is nearly straight. There are four spinules on the inner edge of the endopodite, and about six, interspersed with fine setæ, on that of the peduncle.

Occurrence.—"Cruz Bay, St. Jan" (Danish West Indies). Chr. Levinsen Coll., Copenhagen Museum. Co-types in British Museum.

CUMELLA LEPTOPUS, sp. n. (Plate XXXII. figs. 11-14.)

Description of adult Male.—Total length 2.2 mm.

Carapace about one-third of total length, its depth a little more than half of its length. Dorsal edge very slightly sinuous, without spines. The eye is very large, with about seven large and prominent corneal lenses, of which one is in the middle line in front of the ocular lobe; in all the specimens examined the eyes are without conspicuous pigment. The pseudorostrum is practically obsolete, the lateral plates apparently not meeting in front of the ocular lobe. The antero-lateral margin is concave, and the angle, which is slightly prominent, is rounded. The last somite of the abdomen is less than two-thirds as long as the preceding, and is produced and pointed posteriorly. The lateral grooves are distinct on all the abdominal somites except the last and the antennal flagellum is about as long as the body.

The antennules have the peduncle rather slender, the last segment being about three times as long as thick, and the inner flagellum minute and unsegmented.

The first legs have the basis about equal in length to the remaining segments and the propodus two and a half times as long as the dactylus. The second legs have the distal segments slender, and the carpus more than twice as long as the merus.

The posterior legs are very slender. The last pair are a little shorter than the carapace and have the basis about two-thirds as long as the remaining segments; the carpus is about three-fourths as long as the basis and four times as long as the merus.

The uropods are long and slender; the peduncle is more than twice as long as the last somite and has about nine spines on its inner edge; the endopodite is less than half the length of the peduncle, with a long slender apical spine and six spines on the inner edge; the exopodite is about five-sixths as long as the endopodite and its terminal spine is very long and slender.

Occurrence.—"Cruz Bay, St. Jan" (Danish West Indies). Chr. Levinsen Coll., Copenhagen Museum. Co-type in British Museum.

CUMELLA HISPIDA, sp. n. (Plate XXXII. figs. 15-18.)

Description of adult Female.—Total length 2.55 mm.

Carapace a little less than one-third of total length, its depth about half its length. Dorsal edge slightly arched, with a shallow depression in front of the hinder margin

and two teeth in front of the middle. The ocular lobe is prominent on the dorsal surface and the eye is pigmented. The pseudorostrum is long, directed obliquely upwards, and acutely pointed; the lateral plates meet in front of the ocular lobe for a distance much greater than the diameter of the lobe. The antero-lateral margin is concave and the lower corner is nearly rectangular. The surface of the carapace and of the rest of the body bears rather numerous scattered hairs.

The abdomen is a little shorter than the cephalothorax. The last somite is about equal in length to the preceding, not inflated; seen from above it increases only slightly in width posteriorly, and is produced as a broad rounded lobe for some distance between the bases of the uropods.

The antennules have the peduncle rather slender, the last segment being more than three times as long as thick, and the inner flagellum minute and unsegmented.

The first legs have the basis a little less than two-thirds as long as the remaining segments; that of the second legs is about two-thirds as long as the remaining segments.

The remaining legs are slender; the last pair are a little shorter than the carapace and have the carpus three times as long as the merus and four-fifths as long as the basis.

The uropods have the peduncle about three-fourths as long as the last somite. The straight endopodite, together with the terminal spine which is indistinctly marked off from it, measures a little more than the length of the peduncle and is longer by one-fourth than the exopodite. There are two spinules on the inner edge of the endopodite and two on that of the peduncle.

Occurrence.—Gulf of Siam, "Koh Kam, 5 fathoms, 6/2/00." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

CUMELLA SERRATA, sp. n. (Plate XXXII. figs. 19–24.)

Description of adult Female.—Total length 2.2 mm.

Carapace less than one-third of total length, compressed, its depth nearly two-thirds of its length. The dorsal edge is slightly convex, with about six curved teeth, of which one is set on a prominence just behind a shallow depression and in front of the hind margin. The ocular lobe is prominent on the dorsal surface and is provided with distinct lenses, but without pigment. The pseudorostrum is long, directed obliquely upwards, and acutely pointed; the lateral plates meet in front of the ocular lobe for a distance greater than the diameter of the lobe. The antero-lateral margin is concave and the angle bears an acute tooth. The surface of the carapace and of the rest of the body bears only inconspicuous scattered hairs.

The abdomen is equal in length to the cephalothoracic region. The last somite is shorter than the preceding, not inflated; seen from above it increases slightly in width

posteriorly and projects as a rounded lobe for some distance between the bases of the uropods.

The antennules have the last segment of the peduncle about three times as long as thick and a little shorter than the preceding.

The first legs have the basis little more than half as long as the remaining segments; that of the second legs is little shorter than the remaining segments.

The posterior legs are rather slender; the last pair are a little shorter than the carapace and have the carpus more than twice as long as the merus and nearly as long as the basis.

The uropods have the peduncle longer by about one-fourth than the last somite. The endopodite without its stout terminal spine is about two-thirds as long as the peduncle and more than half as long again as the exopodite. There are three spinules on the inner edge of the endopodite and four on that of the peduncle.

Adult Male.—Total length 2·3 mm.

Carapace about one-third of total length, its depth about half its length. The dorsal edge is nearly straight, without teeth. The ocular lobe bears a number of large and prominent lenses, but is without pigment. The pseudorostrum is short, obliquely truncated, with the upper edge slightly concave; the lateral plates meet in front of the ocular lobe for a distance less than the diameter of the lobe. The antero-lateral margin is oblique and the angle is rounded. The surface of the body is without conspicuous hairs.

The abdomen is shorter than the cephalothoracic region. The last somite is shorter than the preceding, not inflated; seen from above it is more than two-thirds as broad as long, increasing slightly in width posteriorly and projecting as a rounded lobe for some distance between the bases of the uropods. The lateral antennal grooves are distinct on all the somites except the last.

The antennules have the last segment of the peduncle about three times as long as thick and distinctly shorter than the preceding. The flagella of the antennæ are about as long as the body.

The proportions of the legs are much as in the female. The last pair are distinctly shorter than the carapace and have the carpus two and a half times as long as the merus and nearly as long as the basis.

The uropods have the peduncle longer by one-half than the last somite. The endopodite, without its terminal spine, is less than two-thirds as long as the peduncle and distinctly more than half as long again as the exopodite. There are six spinules on the inner edge of the endopodite and the same number on that of the peduncle.

Occurrence.—"Cruz Bay, St. Jan (Danish West Indies), 6/96." Chr. Levinsen Coll., Copenhagen Museum. Co-types in British Museum.

CUMELLA LEVIS, sp. n. (Plate XXXII. figs. 25-27.)

Description of adult Female.—Total length 1.15 mm.

Carapace a little more than one-third of total length, its depth more than half its length. Dorsal edge horizontal, slightly sinuous, without teeth. The ocular lobe is prominent on the dorsal surface and the eye is pigmented. The pseudorostrum is very short and truncated, the lateral plates meeting in front of the ocular lobe for a distance less than the diameter of the lobe. The straight antero-lateral margin slopes backward and the angle is obtuse and rounded. The surface of the carapace and of the rest of the body is without conspicuous hairs.

The abdomen is shorter than the cephalothoracic region. The last somite is less than two-thirds as long as the preceding, not inflated; seen from above it is little longer than broad and its broadly rounded posterior lobe projects only for a short distance between the bases of the uropods.

The antennules have the peduncle rather stout, the last segment being about two and a half times as long as wide and shorter than the preceding segment; the inner flagellum is minute and unsegmented.

The first legs have the basis about half as long as the remaining segments; that of the second legs is more than two-thirds as long as the remaining segments.

The remaining legs are short and stout; the last pair are little more than two-thirds as long as the carapace and have the carpus about one-half longer than the merus and little more than half as long as the basis.

The uropods have the peduncle nearly twice as long as the last somite. The subequal rami are more than two-thirds as long as the peduncle and each bears a slender terminal spine sharply marked off from it. There are four spines increasing in length distally on the inner edge of the endopodite.

Occurrence.—Gulf of Siam, "Koh Kam, 1-5 fathoms, 1/1/00, 6/2/00," "Between Koh Mesan and Cape Liant, 5-8 fathoms, 7/2/00." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

Genus NANNASTACUS.

The discrimination of species in this genus presents difficulties which I have not been able altogether to overcome. The collection of the Copenhagen Museum comprises a very large number of specimens of *Nannastacus*, most of which were collected in the Gulf of Siam by Dr. Th. Mortensen. The great majority of these are males resembling in general characters the male of *N. zimmeri* described below, but differing among themselves in size, in the proportions of the uropods and legs, in the relative size of the eyes, and in other small characters. Most of these characters are subject to individual variation, and after dissecting, drawing, and comparing a number of these males I have reluctantly come to the conclusion that it is impossible, at present, to group them under specific names or to pair them with the different forms of females.

In the case of *N. zimmeri*, the single female specimen was found in a gathering containing numerous specimens of the male and no other Cumacea, so that there is every probability that the two sexes do belong to the same species. In the richer gatherings from the Gulf of Siam, however, two or three closely allied types of female frequently occur in the same bottle with numerous males which cannot be satisfactorily distinguished from one another.

The new species of which females are described below (*N. zimmeri*, *N. gibbosus*, *N. reptans*, *N. minor*, *N. tardus*, and *N. agnatus*) differ from the type of the genus (*N. unguiculatus*) in having no exopod on the third maxilliped in that sex, and I find that the female type specimen of *N. suhmii* G. O. Sars agrees with them in this respect. The males of *N. suhmii* and *N. zimmeri*, however, have a well-developed exopod on that appendage, and it may fairly be assumed that the males of the other species will be found to have it also. The absence of this exopod in the female sex is already known in several species of Diastylidæ, and in that family it has been regarded as a distinction of generic value. It might have been so regarded in this case also, were it not for a further peculiarity presented by *N. reptans* and *N. tardus*. The females described under these names differ from all Cumacea hitherto known in having no thoracic exopods at all; they have lost not only that of the third maxilliped, but also those of the first and second legs; and, curiously enough, each of them was accompanied in nearly all the gatherings in which they occurred by another form hardly differing from the first in any character of importance except in possessing exopods on these legs. Both forms are represented by mature ovigerous females, and I have thought it advisable to describe them under distinct specific names, but it must be admitted as quite possible that *N. reptans* may be merely an individual variation or a phase in the life-history of *N. minor*, and that *N. tardus* may stand in the same relation to *N. agnatus*. At all events, the two pairs of species, if they are specifically distinct, can hardly be generically separated; and since the absence of exopods from the first and second legs seems to be a distinction at least as important as the absence of an exopod from the third maxilliped, there is no good reason for giving generic value to the latter character and not to the former.

I formerly gave as one of the distinguishing characters of the genus *Nannastacus* the absence of a distinct ischium in the second maxillipeds (Fisheries, Ireland, Sci. Invest. 1904, i. (1905) p. 23). In some of the species described below I find indications of a separate ischium in this appendage, but as the character is one which it is difficult to verify without undue sacrifice of material I should prefer to omit it from the generic definition.

As many of the species are known only in one sex it is not possible to give a satisfactory key to their arrangement. I have attempted, however, in the remarks appended to the description of each new species to indicate as far as possible its systematic relations.

NANNASTACUS LEPTURUS, sp. n. (Plate XXXIII. figs. 1-3.)

Description of adult Male.—Total length 2.0 mm.

Carapace a little more than one-third of total length, slightly compressed, dorsal margin slightly arched. The pseudorostrum, seen from the side, is short and truncate. Antero-lateral margin concave, forming a widely open antennal notch; antero-lateral angle rounded, hardly produced. Eyes prominent, darkly pigmented, set rather close together, the distance between them not more than one-eighth of the length of the carapace.

The first leg-bearing somite is distinct. The pleural plates of the succeeding thoracic somites are hardly expanded laterally.

The abdomen is nearly equal to the cephalothoracic region. The somites are cylindrical, each with a well-marked lateral groove; the fifth somite is one and a half times as long as the fourth and twice as long as the last, which is truncate posteriorly.

The peduncle of the antennule has the three segments (as seen without dissection) subequal, the second with a short distal process on the upper side, not reaching beyond the end of the segment; both flagella have two segments, and the inner flagellum is a little shorter than the first segment of the outer.

The first legs have a slender dactylus, about two-thirds as long as the propodus.

In the last pair of legs the basis is little more than one-third of the length of the limb, the carpus is less than twice as long as the merus, and one-third longer than the propodus, which again is about equal to the dactylus with its claw.

The peduncle of the uropods is more than twice as long as the last somite, slender, with five spinules on the finely serrated inner edge. The endopod is about half as long as the peduncle, with a terminal spine of less than half its length and seven spines, increasing in length distally, on the inner edge. The exopod is about four-fifths of the length of the endopod and bears a slender terminal spine of its own length.

Remarks.—*N. longirostris* G. O. Sars, *N. brachydactylus* Calman, and the species described above form a group defined from the other species of the genus by having the peduncle of the uropods at least twice as long as the last somite. *N. hirsutus* Hansen, which has the peduncle only about equal to the last somite, agrees with the first two of these species in the length of the pseudorostrum, of which the lateral plates meet above for at least one-sixth of the total length of the carapace. From all these species *N. lepturus* is distinguished by the very short pseudorostrum and by having the abdomen nearly equal to the cephalothoracic region.

Occurrence.—"Suez, 3/1/98, H. Mortensen." Copenhagen Museum.

NANNASTACUS ZIMMERI, sp. n. (Plate XXXIII. figs. 4-15.)

Description of adult Female.—Total length 1.5 mm.

Carapace a little more than one-third of total length, inflated behind, where the

width is greater than the depth, much narrowed in front. Seen from the side the dorsal edge is convex, with a slight elevation at the posterior margin bearing a small tubercle; the pseudorostrum is short, directed obliquely upwards, narrowly truncate; antero-lateral margin deeply concave, antero-lateral angle produced into a blunt spine with a few setæ at the apex. Seen from above, the lateral plates of the pseudorostrum meet below but not above the respiratory channel, so that the opening of the latter extends back to the interocular margin; only the tips of the antero-lateral angles project laterally. The eyes are small and darkly pigmented, and the distance between them is about one-fourth of the length of the carapace. The surface of the carapace is smooth, with very minute scattered setæ, and there is a slight depression on each side behind the eye.

The first leg-bearing somite is reduced to a very narrow strip behind the carapace, expanding below into the pleural plates, which, like those of the following somites, are spread out laterally.

The abdomen is about equal in length to the cephalothoracic region, slender and cylindrical, without teeth or spines; the fifth somite is about one-third longer than the preceding somite.

The third maxillipeds have no exopods; the basis is a little more than one-third of the total length. The first and second legs carry exopods. The remaining legs are slender and do not differ greatly in length. The proportions of the last pair are much as in the male.

The uropods have the peduncle about half as long as the last somite. The endopod is about three times as long as the peduncle, with a stout terminal spine of less than half its length and two spinules on the inner edge, which is finely serrated throughout. The exopod is less than one-eighth of the length of the endopod, with a slender terminal spine which reaches beyond the middle of the latter.

There is an irregular patch of dark pigment on each side of the anterior part of the carapace and a band encircling the penultimate somite of the abdomen.

Adult Male.—Total length 1.6 mm.

Carapace a little more than one-third of total length, not so deep as in the female, not much narrowed in front, its width greater than its depth. Seen from the side the dorsal edge is nearly straight, with a median depression between the inflated branchial regions; the pseudorostrum is very short and blunt; antero-lateral margin deeply concave, antero-lateral angle rounded and armed with a curved spine, behind which are a few irregular serrations. Seen from above, the lateral plates of the pseudorostrum meet for a short distance above the respiratory channel and the antero-lateral angles project laterally. The eyes are large and darkly pigmented, and the distance between them is not more than one-sixth of the length of the carapace. The surface of the carapace is very minutely granular.

The first leg-bearing somite is hardly visible and its pleural plates are very small.

The pleural plates of the succeeding somites are not so much expanded laterally as in the female.

The abdomen is about equal in length to the cephalothoracic region, without teeth or spines on the dorsal surface, but with a lateral groove overhung by a serrated crest on each of the somites; the fifth somite is at least one-half longer than the fourth.

The antennule has a rather slender peduncle, the first segment about as long as the other two together; the second segment is produced distally into a narrow process bearing a group of plumose setae; the inner flagellum is unsegmented and equal in length to the first of the two segments of the outer.

The flagellum of the antenna extends, in the natural position, at least as far as the penultimate somite of the abdomen.

The mouth-parts closely resemble those of *N. unguiculatus*, but the palp of the maxillula is relatively a little longer. The third maxilliped has a well-developed exopod and the basis is about half of the total length.

The first legs have the basis little more than half the combined length of the remaining segments; there are no teeth on the outer margin of the ischium and merus.

The legs of the last pair are less than one-third of the length of the body; the basis is about one-fourth of the length of the limb, the carpus nearly four times as long as the merus and nearly one and a half times as long as the propodus; the dactylus with its claw is a little longer than the carpus.

The uropods have the peduncle about two-thirds as long as the last somite. The endopod is about three times as long as the peduncle, with a terminal spine of one-third of its length and five spinules on the distal part of the finely serrated inner edge. The exopod is about one-tenth of the length of the endopod and its terminal spine reaches beyond the middle of the latter.

As in the female, there are some irregular patches of pigment on the side of the carapace and a band encircling the penultimate somite and there are also less distinct and less constant bands on the third and fourth abdominal somites.

Remarks.—This species is closely allied to *N. suhmi* G. O. Sars ('Challenger' Rep. Cumacea (1887), p. 63, pl. x. figs. 4–5). As I have elsewhere mentioned (Herdman's Rep. Ceylon Pearl Fisheries, Royal Soc. pt. ii. (1904) p. 177), the type specimens of that species are now more accessible for examination than when they were described by Prof. Sars, although they are by no means in a good state of preservation. In the female specimen I find no trace of an exopod on the third maxilliped, and I believe that the species agrees with *N. zimmeri* in this character, Sars's mention of a small exopod on "the second pair of gnathopoda" being based on some misinterpretation of the mounted specimen. The female *N. suhmi*, however, differs from the species described above in the form of the carapace, which, as shown in Sars's figure, has the branchial regions very strongly inflated and the posterior part of the dorsal surface much more prominent;

there seems to have been a median spine or tooth a little in front of the middle of the dorsal surface; the anterior abdominal somites have strong paired teeth on the dorsal side; and the exopod of the uropods, with its spine, is not more than one-third of the length of the endopod. The males of the two species are much more alike, but in *N. suhmi* the exopod of the uropods is much shorter than in the species described above, being even shorter, relatively, than in the female (the proportion of one-fourth of the exopod, which I formerly mentioned for the males, is, however, slightly exceeded in some specimens).

Occurrence.—"Trincomali, Ceylon, surface, 3/1889, K. Fristedt Coll." Copenhagen Museum. Co-types in British Museum.

NANNASTACUS GIBBOSUS, sp. n. (Plate XXXIII. figs. 16–21.)

Description of adult Female.—Total length 1·8 mm.

Carapace two-fifths of total length, little broader than deep. The pseudorostrum is very short and truncate and the two parts meet together in the middle line below the respiratory orifice. The antero-lateral margin is deeply concave, the antero-lateral corner produced and triangular, sometimes with one or two teeth at the tip. The eyes are prominent and darkly pigmented. The surface of the carapace is very uneven, but the inequalities are developed in varying degrees in different specimens. The branchial regions are inflated to form rounded bosses, between which the dorsal surface is depressed in the middle line. Posteriorly, the dorsal surface is elevated more or less and there is a small boss on each side just behind the eyes. One or two spiniform teeth are commonly set on the posterior elevation of the dorsal surface and another in the middle a little way behind the eyes, but all of these may be absent. A number of long setæ are scattered over the surface of the carapace.

The first leg-bearing somite is represented only by the pleural plates. The remaining thoracic somites have the pleural plates expanded and rounded. The second and the last somites may have a spiniform tooth in the middle of the dorsal surface, as may also the first abdominal.

The abdomen is a little shorter than the cephalothoracic region, the fifth somite is about twice as long as deep and rather more than one-third longer than the preceding somite.

The antennule has the third segment of the peduncle longer than the second and, together with it, longer than the first; the outer flagellum has a minute terminal segment.

The third maxillipeds have no exopods; the basis is about one-third of the total length of the limb.

The first legs have well-developed exopods; the basis is about two-sevenths of the total length of the limb.

The second legs have well-developed exopods; the basis is inflated and is about

three-fourths as long as the distal segments together; the distal segments are broad, the carpus is distinctly longer than the merus, and the dactylus is twice as long as the propodus.

The remaining legs do not differ greatly in length; the last pair are about one-third of the total length of the body. The basis is a little over one-fourth of the length of the limb, the carpus is a little more than twice as long as the merus and about equal to the propodus.

The uropods have the peduncle a little over three-fourths as long as the last somite, with two small teeth on the inner edge. The endopod is nearly three times as long as the peduncle, with a stout terminal spine of about one-third of its length and with five small spines on its inner edge. The exopod is less than one-eighth as long as the endopod, with a slender terminal spine which does not reach to the end of the latter.

Remarks.—The specimens described above resemble the female of Sars's *N. suhmi* even more closely than does that of *N. zimmeri*, especially in the inflated branchial regions and the posterior gibbosity of the carapace. They differ from *N. suhmi* in the shorter and more obtuse pseudorostrum, in the less prominent dorso-lateral teeth of the first abdominal somite and their absence from the following somites, in the shorter carpus of the posterior legs, and in the much longer exopod of the uropods.

Occurrence.—Gulf of Siam, "Koh Chang, about 1 fathom, coral," "Koh Kam, 5 fathoms, mud." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

NANNASTACUS REPTANS, sp. n. (Plate XXXIII. figs. 22-28.)

Description of adult Female.—Total length 1.5 mm.

Carapace more than one-third of total length, little broader than deep. The pseudorostrum is very short and truncate, and the two parts meet together in the middle line below the respiratory orifice. The antero-lateral margin is deeply concave, the antero-lateral corner produced and triangular. The eyes are prominent and darkly pigmented. The surface of the carapace is very uneven, being depressed in the middle line between the inflated branchial regions and with a median convexity anteriorly. A few long setæ are set on the branchial regions and on other parts of the surface.

The first leg-bearing somite appears to be represented only by the pleural plates. The remaining thoracic somites have the pleural plates expanded and rounded, without spines. The last thoracic and the first abdominal somites have each, on the dorsal surface, a pair of small spiniform teeth.

The abdomen is nearly equal to the cephalothoracic region; the fifth somite is a little less than twice as long as deep and about one-third longer than the preceding somite.

The antennule has the second and third segments of the peduncle subequal and

together about equal to the first segment. The outer flagellum has a minute terminal segment.

The mandibles, maxillulæ, maxillæ, and first maxillipeds appear to differ in no conspicuous characters from those of *N. unguiculatus*. The second maxillipeds have the basis only about one and a half times as long as broad; the basal plate carries seven setæ.

The third maxillipeds have no exopods; the basis is less than one-third of the total length of the limb; the distal segments are relatively very stout.

The first legs also are without exopods. The basis is not more than one-quarter of the total length of the limb.

The second legs have no exopods. The basis is not inflated and is little shorter than the remaining segments together. The distal segments are broad, the carpus is hardly longer than the merus, and the broad dactylus is not twice as long as the propodus.

The remaining legs increase slightly in length to the last pair, which are about two-fifths of the total length of the body; the basis is a little over one-fourth of the length of the limb, the carpus is not three times (in the third pair it is less than twice) as long as the merus and a little shorter than the propodus.

The uropods have the peduncle about two-thirds as long as the last somite, with two small teeth on the inner edge. The endopod is about twice as long as the peduncle, with a stout terminal spine of about half its length and with three minute spines and a small seta on the inner edge. The exopod is less than one-fifth as long as the endopod, with a slender terminal spine which reaches nearly to the end of the latter.

Remarks.—This species differs from that last-described in the form of the carapace (which has the branchial regions less inflated and the anterior part of the dorsal surface more strongly arched), in the greater length of the posterior legs, and in the different proportions of the uropods. It differs more remarkably in the absence of exopods from the legs of the first and second pairs, in which respect it resembles the species described below as *N. tardus*.

Occurrence.—Gulf of Siam, "Koh Kabdat, about 1 fathom, coral, i.-ii./00," "Koh Chang, 1 fathom, coral, i.-iii./00." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

NANNASTACUS MINOR, sp. n. (Plate XXXIV. figs. 1-3.)

Description of adult Female.—Total length 1.3 mm.

Carapace not quite two-fifths of total length, little broader than deep. Pseudo-rostrum very short and truncate, the two parts meeting in the middle line below the respiratory orifice. Antero-lateral margin deeply concave, the antero-lateral corner produced and triangular. Eyes prominent and darkly pigmented. Surface of carapace not very uneven, the branchial regions only slightly inflated, with a depression between

them in the mid-dorsal line. There are a few scattered setæ on the surface of the carapace.

The first leg-bearing somite is represented only by the pleural plates. The remaining thoracic somites have the pleural plates expanded and rounded.

The abdomen is shorter than the cephalothoracic region; the fifth abdominal somite is barely twice as long as deep, and less than one-third longer than the preceding somite.

The antennule has the third segment of the peduncle shorter than the second and, together with it, a little shorter than the first.

The third maxillipeds have no exopods; the basis is less than one-third of the total length of the limb; the distal segments, especially the carpus and propodus, are very stout and only slightly flattened.

The first legs have well-developed exopods; the basis is about two-sevenths of the total length of the limb; the distal segments, especially the carpus and propodus, are expanded and flattened.

The second legs have well-developed exopods; the basis is inflated and is about equal to the remaining segments together; the distal segments are broad, the carpus is distinctly longer than the merus, and the dactylus is only a little longer than the propodus.

The remaining legs do not differ greatly in length. The last pair are about two-fifths of the total length of the body; the basis is more than one-fourth of the length of the limb, the carpus is about twice as long as the merus and a little shorter than the propodus.

The uropods have the peduncle nearly two-thirds as long as the last somite. The endopod is about twice as long as the peduncle, with a stout terminal spine of more than half its length, and with three small spines on its inner edge. The exopod is about one-fifth as long as the endopod, with a slender terminal spine which reaches nearly to the end of the latter.

Remarks.—Apart from the possession of exopods on the first and second pairs of legs this species resembles the preceding somewhat closely, especially in the relative length and proportions of the posterior legs and of the uropods. There are, however, small but constant differences in the form of the carapace, which has the branchial regions less inflated and the dorsal surface less arched; in the stoutness of the distal segments of the third maxillipeds and first pair of legs; and some small differences of proportion noted in the description above. It has already been mentioned as a possibility that this species may represent only a variation or a phase of development of *N. reptans*, but I do not think that this is probable.

Occurrence.—Gulf of Siam, "Koh Kahdat, about 1 fathom, coral, 1/2/00," "Koh Chang, 1 fathom, coral, 1/3/00." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

NANNASTACUS TARDUS, sp. n. (Plate XXXIV. figs. 4-11.)

Description of adult Female.—Total length 1.6 mm.

Carapace about three-sevenths of total length, considerably broader than deep. The pseudorostrum is very short and truncate, and the two parts meet together in the middle line below (and apparently also above) the respiratory orifice. The antero-lateral margin is deeply concave, the antero-lateral corner produced and triangular, extending in front of the pseudorostrum, the lower edge serrated anteriorly. The surface of the carapace is not very uneven and the branchial regions are only slightly inflated.

The first leg-bearing somite is represented only by the pleural plates, which, like those of the following somites, are greatly expanded laterally and bear a marginal row of laminar spines (partially detached in the specimen figured). The second leg-bearing somite has a small median tooth dorsally.

The abdomen is shorter than the cephalothoracic region: the first somite has a pair of small dorso-lateral teeth, but these are often absent, or perhaps readily become detached; the fifth somite is at least twice as long as deep and nearly one-half longer than the preceding somite.

The antennule has the second and third segments of the peduncle subequal and together about equal to the much stouter first segment.

The third maxillipeds have no exopods. The basis is less than one-third of the total length of the limb, and its distal process is very long and narrow.

The first legs also have no exopods. The basis is about two-sevenths of the total length of the limb, and has a prominent rounded lobe on its inner edge.

The second legs are without exopods. The basis is about three-fourths as long as the remaining segments together. The carpus is much longer than the merus and the dactylus is not twice as long as the propodus.

The remaining legs are subequal in length and less than one-third as long as the body. The basis is about one-fourth of the length of the limb, the carpus is less than three times as long as the merus and about equal to the propodus.

The uropods have the peduncle little more than half as long as the last somite. The endopod is a little more than twice as long as the peduncle, with a stout terminal spine of less than half its length and three small spines on the distal part of its inner edge. The exopod is about one-sixth as long as the endopod, and its terminal spine does not reach to the end of the latter.

Remarks.—In the form of the carapace, with its strongly produced antero-lateral angles and slightly inflated branchial regions, this species approaches more closely to *N. unguiculatus* than to any other species hitherto described. It differs from that species, however, in having no exopod on the third maxilliped, in the absence of spines from the carapace and from the dorsal surface of the posterior abdominal

somites, the much feebler serrations on the lower margin of the carapace, the shorter posterior legs and exopod of the uropods, and in many other details. It also differs from all other Cumacea, with the exception of *N. reptans* described above, in having no exopods on the first and second pairs of legs.

Occurrence.—Gulf of Siam, “Koh Kam, 5–10 fathoms, 2/00,” “Koh Kahdat, 4–5 fathoms, 16/2/00,” “Between Koh Mesan and Cape Liant, 5–8 fathoms, 8/2/00,” “North of Koh Mesan, 10–15 fathoms, 15/2/00.” Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

NANNASTACUS AGNATUS, sp. n. (Plate XXXIV. figs. 12 & 13.)

Description of adult Female.—Total length 1·3 mm.

Resembling the specimens of *N. tardus* very closely, but having well-developed exopods on the legs of the first and second pairs. The basis of the first legs is a little shorter, but is shaped as in that species; the basis of the second legs is a little longer; the posterior legs appear to be slightly stouter and shorter. The last somite is distinctly shorter and the peduncle of the uropods is more than half its length.

Remarks.—Apart from the presence of exopods on the first two pairs of legs, I have not been successful in finding any characters other than those mentioned above to differentiate this species from *N. tardus*. The possibility suggests itself, therefore, even more strongly than in the analogous case of *N. reptans* and *N. minor*, that we have to do here with a single species in which the exopods may be lost (1) by accident, (2) as a matter of individual variation, or (3) normally in the course of the breeding-period. The analogy of other Cumacea makes the first of these very improbable; as regards the third it is to be noted that both forms are represented by ovigerous females, and that the specimens of *N. tardus* are on the whole, a little longer than those of *N. agnatus*. I do not think that any importance can be attached to the fact that, except in one case, the two forms occurred together in the same gatherings, and in the absence of conclusive evidence that they belong to a single species, it seems convenient to assign specific names to both.

Occurrence.—Gulf of Siam, “Koh Kam, 5–10 fathoms, 2/00,” “Koh Kahdat, 4–5 fathoms, 16/2/00,” “Between Koh Mesan and Cape Liant, 5–8 fathoms, 8/2/00,” “North of Koh Mesan, 10–15 fathoms, 2/00.” Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

SCHIZOTREMA, gen. nov.

Carapace more or less depressed, not overhanging the anterior free somites; lateral plates of pseudorostrum not meeting in front of head, exhalant respiratory orifices paired and widely separated from each other; third maxillipeds and first two pairs of legs with exopods in female: other characters as in *Nannastacus*.

Type-species *S. depressum*, sp. n.

This genus bears the same relation to *Nannastacus* that *Zygosiphon* bears to *Cyclaspis*. No males have yet been identified, but the analogy of *Zygosiphon* makes it probable that the division of the respiratory openings will be found in that sex also. In the type-species the second maxilliped has a distinct ischium, but for reasons already mentioned (p. 351) I prefer not to regard this character as of generic value.

Key to the Species of Schizotrema.

- A. Carapace very broad and depressed; a conspicuous lateral series of spines on carapace, posterior thoracic somites, and abdomen; peduncle of uropod longer than last somite *S. depressum*, sp. n.
- B. Carapace less depressed; no conspicuous lateral spines on carapace or abdomen; peduncle of uropod not more than half as long as last somite.
 - a. Surface of body with numerous small spines and tubercles; antero-lateral angle of carapace produced as a stout cylindrical process . . . *S. bifrons*, sp. n.
 - b. Surface of body for the most part smooth; antero-lateral angle produced as a slender tooth *S. sordidum*, sp. n.

SCHIZOTREMA DEPRESSUM, sp. n. (Plate XXXIV. figs. 14-17.)

Description of adult Female.—Total length 1.5 mm.

Carapace a little less than one-third of total length, very broad and depressed. The pseudorostrum, seen from the side, is very short and truncate, directed obliquely upwards. Seen from above, the two parts of the pseudorostrum are widely separated, each completely surrounding the respiratory orifice, from which a long branchial siphon is protruded. The antennal notch is obsolete, the antero-lateral margin descending nearly vertically to the rounded antero-lateral corner, which carries a stout curved spine. A series of spines runs backwards from this along the lateral edge of the carapace, diminishing in size until the last two or three, which are again larger. The darkly-pigmented eyes lie just behind the branchial openings; the number of corneal facets could not be determined. The surface of the carapace is everywhere minutely granular, and, in some specimens, there is found on each of the branchial regions and on an elevation of the dorso-lateral surface on each side behind the eye a large granule or vesicular outgrowth, which apparently is very easily detached.

The free thoracic somites are very broad and depressed, their pleural plates armed with large spines.

The abdomen is shorter than the cephalothoracic region. The somites, with exception of the first, have a series of stout spines on each side; the last somite is shorter than the penultimate and is rounded posteriorly.

Long setæ are set here and there over the surface of the body, and a very conspicuous row of them fringes the lateral margins of carapace, free thoracic somites, and abdomen.

These lateral setæ are always thickly encrusted with mud, and as they project horizontally they greatly increase the apparent breadth and flatness of the body.

The antennule resembles closely that of *Nannastacus unguiculatus*, but the third segment of the peduncle is longer than the second, and only two segments could be detected in the outer flagellum. The antenna has the conical tip more produced than in the species named, and the basal part has two teeth on its anterior margin.

The mouth-parts resemble those of *N. unguiculatus*, except in trivial details. The third maxillipeds have a well-developed exopod, and have the carpus and propodus somewhat broadened.

The first legs are relatively longer than in *N. unguiculatus*. The basis is about two-fifths as long as the distal segments together. No teeth could be detected on the outer edge of the basis, ischium, or merus. In the second legs the distal segments are a little stouter than in the species named, and there are no conspicuous teeth on the outer edge of the basis.

The last three pairs of legs are much stouter and shorter than in *N. unguiculatus*. In the third pair the basis is about two-thirds as long as the distal segments together, the carpus is hardly longer than the merus and shorter than the propodus. In the fifth pair the basis is more than half as long as the distal segments together; the carpus is about one-half longer than the merus and about equal to the propodus; the dactylus, with its claw, is about equal to the propodus.

The uropods have the peduncle a little longer than the last somite, slightly expanded distally, with three conspicuous teeth on the inner edge. The endopod is a little longer than the peduncle, with a strong terminal spine a little longer than the ramus itself and a shorter spine near the distal end of the inner edge. The exopod is more than three-fourths as long as the endopod, with a long and slender terminal spine.

Occurrence.—Gulf of Siam, "Koh Kahdat, about 1 fathom, coral." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

SCHIZOTREMA BIFRONS, sp. n. (Plate XXXIV. figs. 18–21.)

Description of adult Female.—Total length 1.65 mm.

The carapace is a little less than two-fifths of the total length, its height not more than two-thirds of its greatest width. The pseudorostrum, seen from the side, is very short and rounded, with a group of curved spines on its lower edge; seen from above, the two parts of the pseudorostrum surrounding the respiratory orifices are widely separated; the branchial siphons are long. The antero-lateral margin slopes backwards from the lower edge of the pseudorostrum, and a widely open and angular antennal notch is completed below by the antero-lateral angle, which is produced as a stout cylindrical process tipped with a curved spine; a row of small spines on the outer surface of this process runs backwards on to the side of the carapace. The darkly pigmented eyes, each with three corneal facets, lie just behind the respiratory

orifices. The surface of the carapace bears irregularly scattered small spines or tubercles interspersed with short hairs.

The first leg-bearing somite is almost entirely concealed; the remaining thoracic somites are broad and depressed, with a few small tubercles on the dorsal surface and on the pleural plates.

The abdomen is a little shorter than the cephalothoracic region. The somites are short and stout, the penultimate not longer than the preceding and shorter than the last somite, which is acutely pointed in the middle line posteriorly; they bear a few tubercles and short hairs.

The antennules have a rather stout peduncle, with two spines at the distal end of the first segment.

The third maxilliped has a well-developed exopod.

The posterior legs are rather long and slender. In the fifth pair the basis is about two-fifths as long as the distal segments together, the carpus is nearly three times as long as the merus and a little longer than the propodus; the dactylus, together with its strongly curved claw, is about three-fourths as long as the propodus.

The peduncle of the uropods is about half as long as the last somite and not much longer than broad, irregularly toothed on the outer and inner edges. The endopod is about two and a half times as long as the peduncle, strongly serrated on both edges, with a stout terminal spine of nearly half its length, and a small spine close to it at the distal end of the inner edge. The exopod is a little less than half as long as the endopod, and its slender terminal spine reaches beyond the end of the latter.

Occurrence.—"Paumben, India, 1-5 fathoms, K. Fristedt Coll." Copenhagen Museum.

SCHIZOTREMA SORDIDUM, sp. n. (Plate XXXIV. figs. 22-24.)

Description of adult Female.—Total length 1 mm.

Carapace nearly two-fifths of total length, rather broad and depressed. The pseudorostrum, seen from the side, is short and truncate, directed obliquely upwards; seen from above the two parts of the pseudorostrum surrounding the respiratory orifices are completely separated; the branchial siphons are long. The antennal notch is obsolete, the antero-lateral corner is produced into a slender point bearing a transparent apical spine. The darkly-pigmented eyes lie just behind the branchial openings; the number of corneal facets could not be determined. The surface of the carapace is sparsely covered with long hairs, but no spines were observed.

The free thoracic somites are broad and depressed, their pleural plates carrying long hairs and a few transparent and inconspicuous spines.

The abdominal somites are beset with long hairs, but these do not form a distinct lateral fringe as in *S. depressum*. The last somite is a little shorter than the penultimate and is rounded posteriorly.

The antennule has the third segment of the peduncle slightly longer than the second; the outer flagellum has three segments, the terminal one minute.

The third maxilliped has a well-developed exopod.

The first legs have the basis about one-third as long as the distal segments together, without teeth on the proximal segments. The last three pairs of legs are very long and slender. In the last pair the basis is little more than two-fifths as long as the distal segments together, the carpus is nearly four times as long as the merus and one-third longer than the propodus; the slender curved dactylus, with its claw, is about two-thirds as long as the propodus.

The peduncle of the uropods is not more than half as long as the last somite, without distinct teeth on the inner edge. The endopod is more than three times as long as the peduncle, serrated with very transparent teeth on its inner edge, and with a slender terminal spine. The exopod is about half as long as the endopod.

Remarks.—The incrustation of mud which commonly covers the body and limbs in species of this genus rendered the examination of this very minute form tedious and difficult. In removing the mud it is possible that some spines on the surface of the carapace may have been detached and overlooked, and it is probable that the number of hairs on the body and limbs was greatly diminished.

Occurrence.—Gulf of Siam, "Koh Chang, about 1 fathom, coral," "Koh Kahdat, 1 fathom, coral." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

CAMPYLASPIS PLATYUROPUS, sp. n. (Plate XXXIV. figs. 25–29.)

Description of immature Female (with developing brood-pouch).—Total length 1.8 mm.

The carapace is a little more than one-half of the total length and its dorsal surface is strongly arched. On each side is an oblique dorso-lateral ridge which curves towards the middle line on the posterior part of the dorsal surface. The pseudo-rostrum is short and truncated and the antennal notch is obsolete. The ocular lobe is very small and the eye is not distinct.

The abdominal somites are stout and are slightly depressed.

The mouth-parts have the structure usual in the genus.

The third maxillipeds have a well-developed exopod; the basis is shorter than the distal segments together; the merus is greatly expanded, less than twice as long as broad, and longer than the last three segments together.

The first legs have the basis about as long as the distal segments together; the ischium is produced internally into a large but thin and transparent triangular tooth.

The second legs have the terminal segment rather stout and shorter than the two preceding together.

The uropods are remarkably broad and flattened. The peduncle is less than twice

as long as the last somite and two and a half times as long as broad, while its vertical thickness is little more than half its width. The endopod is about three-quarters as long as the peduncle, and its width near the base is about one-third of its length; it has seven spines on the inner edge, a longer terminal spine, and a small spinule external to the latter. The exopod is distinctly shorter than the endopod, with two slender terminal spines and one spinule each on the inner and outer edges.

Young Specimen.—In a very young specimen only .9 mm. long, which I suppose to belong to this species, the flattening of the uropods is still more marked, the peduncle being little longer than broad, while the endopod is only about twice as long as broad.

Remarks.—In spite of its small size, the larger of the two specimens described above appears to be approaching maturity, and we may therefore assume that the broadened form of the uropods, though less marked than in the young, does not disappear in the adult.

Occurrence.—Gulf of Siam, "Koh Kam, 10 fathoms, 4/2/00," "Between Koh Mesan and Cape Liant, 5-8 fathoms, 7/2/00." Th. Mortensen Coll., Copenhagen Museum.

CAMPYLASPIS ORIENTALIS, sp. n. (Plate XXXV. figs. 1-5.)

Description of adult Female.—Total length 5.5 mm.

Closely resembling *C. rubicunda* Lilljeborg, as described by Sars. The pseudo-rostrum is very short and truncated as seen from above. The ocular lobe is longer than broad and the eye is indistinct. The abdominal somites are not depressed and are without lateral carinæ. The terminal segment of the first maxillipeds is larger than in Sars's figures. Third maxillipeds differing considerably from those of *C. rubicunda*; basis much longer than the distal segments together; ischium slightly produced internally; merus not greatly expanded, not wider than ischium, its inner edge straight or slightly concave, not nearly equal to the two succeeding segments together; propodus much longer than carpus. None of the segments are conspicuously serrated on the margins. First legs with the merus not expanded, hardly longer than the carpus. Second legs with the terminal segment shorter than the two preceding segments together, stouter than in *C. rubicunda*, with a long terminal seta. Uropods with peduncle about twice as long as last somite, not serrated internally; endopod about half as long as peduncle, with about eight spines on inner edge, terminal spine stouter than in *C. rubicunda*.

The specimens retain traces of a reddish-purple colour.

Remarks.—The resemblance of the specimens described above to *C. rubicunda* is so close that I should have been inclined to identify them with that species had it not been for the difference in shape of the third maxillipeds.

Occurrence.—"Korea, 35 fathoms, 22/1/82, Suenson Coll." Copenhagen Museum.
VOL. XVIII.—PART IV. No. 4.—February, 1911.

Family DIASTYLIDÆ.

Dr. C. Zimmer has lately (Cumaceen der Deutschen Tiefsee-Exp. p. 181, 1908) discussed in detail the classification of this extensive family. His re-definition of the genus *Diastylopsis* makes possible a more satisfactory allocation of a number of species previously referred to *Leptostylis*, but there are indications that the grouping of the species can be regarded only as provisional. Thus the general form of the body and the disposition of the posterior thoracic somites, which Zimmer regards as the chief distinguishing features of *Diastylopsis*, are repeated in some of the species of the new genus *Gynodiastylis* described below, and that genus is linked, by the important character of the third maxilliped, to the otherwise widely different *Paradiastylis*. Again, *Leptostylis thileniusi* Zimmer is now referred by its describer to *Diastylopsis*; but it has a very remarkable structure of the third maxilliped not found in the other species of the latter genus, and this structure, as I have pointed out (Ann. Mag. Nat. Hist. (8) i. p. 239, 1908), is clearly derived from the simpler condition found in *Leptostylis insularum*, a species which, according to Dr. Zimmer's classification, would fall into the genus *Diastylis*. On the other hand, the genus *Leptostylis*, reduced within the limits of a relatively precise definition by Zimmer's removal of various species to other genera, must again overrun these limits to include *L. walkeri* (Calman, Bull. Mus. d'Hist. Nat. Paris, 1907, no. 2, p. 121), which, by its well-armed telson, infringes the leading character of the definition.

Of *Diastylis*, which still includes the majority of the species of the family, Dr. Zimmer finds it impossible to give a satisfactory diagnosis—"Man kann einfach sagen, dass *Diastylis* diejenigen Diastylidenarten umfasst, die in keine der anderen Gattungen passen." As a matter of fact, the species included in *Diastylis* differ among themselves in characters which, in some cases, seem as important as those distinguishing the other genera, although without the discontinuity which renders easy the definition of generic groups.

The limits of the family itself tend to become indistinct. Thus, as Dr. Zimmer remarks, it is, with our present knowledge, very much a matter of taste whether *Pseudodiastylis* is to be referred to the Diastylidæ or to the Lampropidæ, and the new genus *Colurostylis* has the form of telson characteristic of the Pseudocumidæ, while the characters excluding it from that family are neither numerous nor very weighty.

Key to Genera of Diastylidæ.

- A. No pleopods present in male sex. (Third maxilliped without exopod in female.) GYNODIASTYLIS, g. n.
- B. Two pairs of pleopods in male sex.
 - a. Third maxilliped without exopod in female PARADIASTYLIS Calman.

b. Third maxilliped with exopod in both sexes.

A. Telson without spines.

- a. Telson very small, flattened; endopod of uropods of two segments; third and fourth legs with vestigial exopods in female COLUROSTYLIS, *g. n.*

- b. Telson larger, cylindrical; endopod of uropods of three segments; third and fourth legs without exopods in female PACHYSTYLIS Hansen*.

B. Telson with at least a pair of apical spines.

- a. Body of mandible abbreviated DIASTYLOIDES G. O. Sars.

b. Body of mandible normal.

- a'. Pleural plates of third and fourth free thoracic somites expanded backwards; third legs widely separated from second in adult female DIASTYLOPSIS S. I. Smith.

- b'. Pleural plates of thoracic somites not produced backwards; third legs close to second in adult female { DIASTYLIS Say.
LEPTOSTYLIS G. O. Sars.

- C. Telson with a median apical spine PSEUDODIASTYLIS Calman.

Genus GYNODIASTYLIS, *gen. nov.*

Pleural plates of third and fourth free thoracic somites more or less expanded backwards, third legs separated from second in adult female; telson unarmed, tubular, not produced beyond anus; third maxillipeds without exopods in female; no pleopods in male; endopod of uropods unsegmented or of two segments.

Type-species *G. carinata*, *sp. n.*

The name of this genus is intended to allude to the fact that the males resemble the females more closely than in the other genera of the family. In the type-species and in *G. laevis* the absence of exopods from the third and fourth pairs of legs makes it difficult to distinguish between males and immature females†. According to the precedents of Cumacean taxonomy, the presence of well-developed exopods on these legs in males of *G. costata* and *G. bicristata* would be regarded as a distinction of generic value, but in view of the close general resemblance between *G. carinata* and *G. costata* it seems impossible, for the present, to place them in separate genera.

Key to the Species of Gynodiastylis.

A. No exopods on third and fourth legs of male.

- a. Carapace with six longitudinal ridges on each side. Endopod of uropods of two segments *G. carinata*, *sp. n.*
b. Carapace smooth. Endopod of uropods unsegmented *G. laevis*, *sp. n.*

* See also the remarks on *Diastylis* (?) *fistularis*, *sp. n.*, below.

† The only other Cumacean of which the males resemble the females in the number of the thoracic exopods and in having no pleopods is *Heteroleucon akaroënsis* (Trans. Zool. Soc. xviii. (1) p. 34, 1907).

B. Exopods present on third and fourth legs of male.

- a. Carapace with numerous longitudinal ridges *G. costata*, sp. n.
- b. Carapace with a pair of dorso-lateral ridges *G. bicristata*, sp. n.

GYNODIASTYLIS CARINATA, sp. n. (Plate XXXV. figs. 6-31.)

Description of adult Female.—Total length 4.0 mm.

Carapace a little less than one-third of total length, its vertical height a little more than one-half of its length, subcylindrical, narrowed in front; dorsal outline very slightly arched as seen from the side. Pseudorostrum straight, horizontal, acutely pointed, a little less than one-fourth of length of carapace. Antennal notch widely open, defined below by the slightly-produced antero-lateral tooth. The surface of the carapace bears six longitudinal ridges on each side. Starting from the hind margin near the middle line, a ridge, somewhat less strongly marked than the others, runs forwards and inwards to meet its fellow at about the middle of the length of the carapace; from nearly the same point on the hind margin the second ridge runs directly forwards as far as the ocular lobe; the third ridge, nearly parallel with the last, curves slightly inwards anteriorly and ends close to the fronto-lateral fissure; the fourth ridge curves upwards a little in front of its origin, bounding a shallow depression on the side of the carapace, and then runs forwards on to the base of the pseudorostrum; the fifth ridge, which is very strong, runs below the above-mentioned depression and ends on the antero-lateral angle; a faintly-marked sixth ridge is visible in some specimens just above the lower margin of the carapace. The ocular lobe is less than twice as broad as long and bears three large but indistinctly defined corneal facets; the eye is without pigment.

All the five leg-bearing somites are distinct. The pleural plates of the third somite are expanded and produced in front and behind and the corresponding appendages are articulated near the posterior end, so that, in the adult female, a wide interval is left between the second and third pairs of legs. In this somite also, and to a greater degree in the two succeeding somites, the attachment of the limb is rotated backwards and upwards, so that, in the last somite, the leg is attached to its posterior border, and, when extended, points directly backwards. The last two somites have each a pair of longitudinal ridges on the dorsal surface.

The abdomen is distinctly shorter than the cephalothoracic region; the somites are slightly depressed, with a lateral longitudinal ridge on each side; as is usual in the Diastylidæ, the hinder edge of each somite is strongly concave on the upper surface. The penultimate somite is little longer than the preceding. The last somite is flattened from above downwards and is about as broad as long.

The telson is two-thirds as long as the last somite. Seen from above it is ovate in outline, its breadth three-fourths of its length, truncated in front and bluntly pointed

at the tip, which bears two extremely minute setiform points. From the side it is seen to be tubular anteriorly, but cut away below from about the middle of its length to receive the obliquely placed anal valves. The apex of the telson does not project beyond the upper ends of the valves.

The antennules have the first segment of the peduncle longer than the other two together, and the second about half the length of the third; the outer flagellum is composed of two segments, of which the first is the longer; the inner flagellum is composed of three segments and is about equal in length to the first segment of the outer.

The antennæ are short, of three segments, with possibly a very minute terminal segment; each segment carries a plumose seta.

The mandibles are of the usual shape, with an elongated body and a row of twelve spines.

The other mouth-parts are of normal type. The maxillular palp is short and carries two setæ.

The first maxilliped has three very long setæ springing from the last three segments. The branchial apparatus is quite devoid of lobules, with the possible exception of a vestigial one near the proximal end.

The second maxilliped has a very long seta springing from the penultimate segment; the basal plate has eight setæ.

The third maxilliped has no exopod; the basis is slightly expanded but not produced distally, where it bears a series of long plumose setæ; the distal segments are rather slender, the propodus a little longer than either the carpus or the dactylus.

The first legs are stout and do not extend much in front of the pseudorostrum; the basis is about three-fourths as long as the distal segments together; the carpus is nearly twice as long as the two preceding segments together and has the inner edge irregularly tuberculate; the propodus is less than half as long as the carpus; the distal half of its inner edge is oblique and bears a series of ten very long smooth setæ, each slightly expanded at the base and four times as long as the segment from which they spring; the dactylus is little more than half as long and one-fourth as broad as the propodus, and bears one very long and some short setæ at the tip.

The second legs have the basis little more than twice as long as broad and as long as the remaining segments together; the distal segments become successively more slender; the dactylus is about as long as the propodus; the ischium is distinct, but very short.

The remaining legs are stout; the merus is slightly inflated, twice to three times as long as the carpus; the dactylus is slender, as long as the propodus, and its terminal spine is straight and very short.

The uropods have the peduncle a little shorter than the last somite and about

two-thirds longer than the telson, slightly thickened distally, where the diameter is about one-third of the length. The exopod is about five-sixths as long as the peduncle; it bears two unequal stout setæ at the tip and two or three, more slender, on the inner edge, while the outer edge is clothed with very fine setæ. The endopod is about four-fifths as long as the exopod and is composed of two segments, the distal less than one-half as long as the proximal; it has a long terminal spine and four spines, each with a secondary seta, on the inner edge.

In the immature female there is no marked interval between the second and third pairs of legs.

Adult Male.—Total length 2.85 mm.

In general form the male resembles an immature female so closely as to be readily mistaken for one. It differs in having the ridges on the carapace somewhat more marked and especially in having strong paired dorso-lateral ridges on all the free thoracic somites instead of only on the last two. The pseudorostrum is narrowly truncated at the tip. The antero-lateral angle is rounded and obscurely serrated, and projects laterally so as to be visible from above.

The antennules have the outer flagellum composed of three segments.

The antennæ are very short, wholly concealed, in the natural position, by the carapace; the flagellum is composed of only eight segments and hardly exceeds in length the last segment of the peduncle, but its segments are well-defined and bear long sensory filaments.

The third maxilliped has an exopod which, in the adult male, is well-formed and carries long setæ, but in immature specimens is imperfectly segmented and has only rudimentary setæ at the tip.

The first legs are shorter than in the adult female, especially as regards the carpus, which is much less than twice as long as the two preceding segments together.

The third pair of legs have the basis stouter than in the female, expanding inwards just above the base so as to form a projecting shoulder. The setæ on the distal segments of this and the succeeding pairs of legs are stouter than in the female.

The uropods differ from those of the female in the fact that the rami are nearly equal in length and that the endopod has its proximal segment but little longer than the distal; the inner edge of the endopod has five spines including the subterminal one.

Remarks.—In addition to the characters which have been mentioned in the generic definition and in the key to the species, attention may be called to the peculiar tuft of long setæ on the propodus of the first legs and to the reduction of the antennal flagellum in the male.

Occurrence.—"Lyttleton Harbour, 1-5 fathoms, 8/97, H. Suter Coll." Copenhagen Museum. Co-types in British Museum.

GYNODIASTYLIS LEVIS, sp. n. (Plate XXXV. figs. 32-39.)

Description of adult Female.—Total length 4.1 mm.

Carapace a little more than one-fourth of total length, its vertical height less than half of its length, subcylindrical, narrowed in front; dorsal outline slightly arched as seen from the side. Pseudorostrum straight, slightly deflexed, truncate, not more than one-eighth of total length of carapace. Antennal notch slightly marked, defined by a very small antero-lateral tooth. The surface of the carapace is quite smooth. The ocular lobe is slightly prominent as seen from the side; it is devoid of pigment and presents no distinct facets.

The first free thoracic somite is very short. The second is very long, more than a third of the length of the carapace as measured along the dorsal edge, and its pleural plate is produced anteriorly as a narrow lobe. The third and fourth somites are together little longer than the second in the dorsal line; their pleural plates are produced backwards and the articulation of the posterior legs is as in *G. carinata*.

The abdomen is slightly shorter than the cephalothoracic region. The somites are somewhat depressed and have faint lateral keels. The last somite is little shorter than the penultimate, about one-third longer than broad, and more than twice as broad as deep.

The telson is little more than half as long as the last somite, its breadth less than two-thirds of its length.

The antennules are shorter and more robust than in *G. carinata*. The first segment of the peduncle is less than twice as long as broad and about equal to the other two together, and the second is two-thirds as long as the third; the flagella are short and each composed of three segments. The antennæ resemble those of *G. carinata*.

The mouth-parts resemble those of *G. carinata*, but the distal setæ of the first and second maxillipeds are shorter than in that species. The third maxilliped is without an exopod; its basis is longer than in *G. carinata* and less expanded distally, where it carries only two or three setæ.

The first legs have the basis nearly twice as long as the distal segments together, produced distally at the inner corner as a strong tooth; the carpus is about as long as the two preceding segments together; the propodus is half as long as the carpus and bears three long setæ on the distal part of its inner edge; the dactylus is two-thirds as long as the propodus.

The second legs have the basis three times as long as broad and nearly twice as long as the remaining segments together; the dactylus and propodus are subequal and together shorter than the carpus.

The remaining legs are stout. The merus in the fifth pair is more than twice as long as the carpus; the dactylus is shorter than the propodus and its terminal spine is short and claw-like.

The uropods have the peduncle two-thirds as long as the last somite and reaching

to two-thirds of the length of the telson, its distal diameter about one-third of its length. The exopod is about as long as the peduncle; it has two unequal stout setæ at the tip and a single small seta on the inner and two on the outer edge. The endopod is a little longer than the exopod and is unsegmented; it has a long terminal spine and six spines on the inner edge, the distal one much longer than the others; there are two or three setæ on the outer edge.

Adult (?) Male.—Total length 2.4 mm.

The male differs from the adult female in having a much shorter distance between the second and third pairs of legs, although the interval is more marked than in the male of *G. carinata*.

The carapace is shaped as in the female, with the pseudorostrum a little shorter and broader, and with the antero-lateral angle rounded. The ocular lobe is a little less prominent on the dorsal surface. The second leg-bearing somite is little longer than the first and its pleural plate is produced forwards as a narrow lobe. The pleural plate of the third somite is produced as a much broader lobe anteriorly.

The last abdominal somite is but little longer than broad and less than half as long again as the telson. The antennules have four segments in the outer flagellum. As in the male of *G. carinata*, the third maxilliped has a well-formed exopod. The difference in length of the rami of the uropods is a little more marked than in the female and the endopod has only four spines on the inner edge.

Remarks.—The difference in size between the sexes, much greater than in the case of *G. carinata*, throws doubt on the maturity of the male specimens described. In the characters of the antenna, however, they seem to be adult, the peduncle having a thick brush of setæ anteriorly, and the short flagellum (which was unfortunately broken in the specimen dissected) being distinctly segmented.

This species, while agreeing with *G. carinata* in having no exopods on the third and fourth legs of the male, differs from it in many important characters. Most conspicuous among these is the great size of the second free thoracic somite in the female. The first leg also differs greatly in the elongation of the basis and the feeble development of setæ on the propodus. Finally, the unsegmented endopodite of the uropods distinguishes the species from all the other members of the genus.

Occurrence.—"Lyttleton Harbour, 1-5 fathoms, 8/97, H. Suter Coll." Copenhagen Museum. Co-types in British Museum.

GYNODIASTYLIS COSTATA, sp. n. (Plate XXXVI. figs. 1-10.)

Description of adult Female.—Total length 2.35 mm.

Carapace about one-third of total length, its vertical height a little more than half its length; dorsal outline very slightly arched as seen from the side. Pseudorostrum straight, horizontal, acutely pointed, a little less than one-fourth of total length of carapace. Antennal notch widely open, defined below by the slightly produced

antero-lateral tooth. The surface of the carapace is longitudinally ribbed, much as in *G. carinata*, but the ridges are more numerous and some of them are ill-defined and interrupted, so that it is difficult to make sure of their exact number and arrangement. There is a shallow depression towards the front on each side of the carapace, and in front of this, just behind the antero-lateral corner, is a short vertical ridge, forming a small tubercle behind the antennal notch, and continued upwards on to the side of the pseudorostrum. When viewed from above, this ridge is seen to carry a series of thin and transparent curved spines. The ocular lobe is about twice as broad as long. The eye is without pigment.

The pleural plates of the third free thoracic somite are produced in front and behind, and the attachment of the posterior legs is as in *G. carinata*. The penultimate thoracic somite has a pair of slightly marked dorso-lateral ridges.

The abdomen is shorter than the cephalothoracic region. The penultimate somite is little longer than the preceding. The last somite is flattened from above downwards and a little broader than long.

The telson is about three-fourths as long as the last somite. Seen from above its breadth is three-fourths of its length, and it is bluntly pointed at the tip, which bears two extremely minute setæ or spinules.

The antennules have the first segment of the peduncle as long as the other two together and the second half the length of the third; the outer flagellum is composed of two subequal segments; the inner flagellum has three segments and is shorter than the first segment of the outer.

The antennæ are short, of four segments, the terminal one very minute; each segment carries a plumose seta.

The first and second maxillipeds have long setæ springing from the distal segments as in *G. carinata*.

The third maxilliped has no exopod; the basis is slightly expanded, but not produced distally, where it bears a series of long plumose setæ; the distal segments are slender, the carpus, propodus, and dactylus subequal.

The first legs are stout and extend well beyond the pseudorostrum; the basis is about one-half as long as the distal segments together; the carpus is a little less than twice as long as the two preceding segments together; the propodus is half as long as the carpus, and the distal third of its inner edge is oblique and bears a series of about eleven smooth setæ, about two and a half times as long as the segment from which they spring; the dactylus is a little more than half the length of the propodus and bears one very long and some short setæ at the tip.

The second legs have the basis about two and a half times as long as broad and as long as the remaining segments together; the ischium is so short as to be easily overlooked; the distal segments become successively more slender; the dactylus is as long as the propodus and bears a small claw-like spine and one or two setæ at the tip.

The remaining legs are subequal in length, and stout. The merus is slightly inflated and about twice as long as the carpus; the propodus is half as long as the carpus and about equal to the dactylus, which is slender, curved, and terminates in a curved claw-like spine.

The uropods have the peduncle longer than the last somite and more than one and a half times as long as the telson, slightly thickened distally where the diameter is about one-third of the length. The exopod is nearly as long as the peduncle. It bears two unequal setæ at the tip and one or two small setules on the outer and inner edges. The endopod is a little longer than the exopod. It is composed of two segments, the distal a little longer than the proximal; it has two unequal spines at the tip and one spine on each segment on the inner edge.

Adult Male.—Total length 1.9 mm.

The carapace is more than one-third of the total length and has the dorsal outline more arched than in the female. The pseudorostrum is shorter and truncated. The antero-lateral serrations could not be demonstrated. The pleural plates of the third leg-bearing somite are not expanded, and there is no marked interval between the second and third pairs of legs.

There are four segments in the outer flagellum of the antennules. The antennæ are very short, only reaching, in the natural position, to the posterior edge of the carapace. There are well-developed exopods on the third maxillipeds and on all except the last pair of legs.

The peduncle of the uropods is about twice as long as the telson, and has four spinules on the inner edge. The rami are nearly equal in length and their terminal spines are long and slender. The endopod has, on the inner edge, two spines on the first and three on the second segment.

Remarks.—Apart from the presence of exopods on the third and fourth pairs of legs in the male, this species is distinguished from *G. carinata*, which it resembles in general characters, by the more numerous ridges on the carapace, by the curved claws of the posterior legs, and by other small characters mentioned above.

Occurrence.—Gulf of Siam, "Koh Kam, 20 fathoms, 4/2/00," "N. of Koh Chuen, 15 fathoms, 5/2/00," "Between Koh Mesan and Cape Liant, 5–8 fathoms, 7/2/00." Th. Mortensen Coll., Copenhagen Museum. Co-types in British Museum.

GYNODIASTYLIS BICRISTATA, sp. n. (Plate XXXVI. figs. 11–22.)

Description of adult Female.—Total length 1.9 mm.

Carapace a little less than two-fifths of total length, its vertical height about two-thirds of its length, inflated; dorsal outline, as seen from the side, strongly arched posteriorly, sloping in front. Pseudorostrum short, horizontal, acutely pointed as seen from the side, truncated as seen from above. Antennal notch open, defined by a triangular antennal tooth. The dorsal surface of the carapace has a pair of strong cristiform ridges, which, starting from the hind margin, diverge anteriorly and then

converge on to the sides of the pseudorostrum; between the crests the dorsal surface is nearly flat. The ocular lobe is nearly twice as broad as long. The eye is without pigment.

The free thoracic somites have each a pair of dorso-lateral crests, in line with those on the carapace, becoming indistinct on the last somite. The pleural plates of the third somite are not greatly expanded laterally and there is no great interval between the second and third pairs of legs. The abdomen is about as long as the cephalo-thoracic region. The penultimate somite is little longer than the preceding. The last somite is flattened and broader than long.

The telson is a little shorter than the last somite and its breadth is five-sixths of its length.

The antennules have the first segment of the peduncle longer than the other two together and the second more than half as long as the third. The outer flagellum is composed of two segments, the inner of three.

The antennæ have three segments, the third longer than the preceding.

The mandibles are of the usual shape. The maxillular palp is short and carries two setæ, both broken in the specimen dissected, but apparently unusually short.

The first and second maxillipeds resemble those of *G. carinata* in having long setæ springing from the distal segments. The branchial apparatus appears to have no lobules.

The third maxilliped has no exopod; the basis is little more than twice as long as broad, slightly expanded and produced distally; the propodus is shorter than the carpus.

The first legs extend well in front of the pseudorostrum; the basis is strongly bent and is about half as long as the distal segments together; the carpus is twice as long as the two preceding segments together; the propodus is less than half as long as the carpus and bears a series of about nine very long setæ on the distal part of its inner edge; the dactylus is little more than half as long as the propodus, and has one very long and some shorter terminal setæ.

The second legs have the basis about twice as long as broad and a little longer than the remaining segments together; the ischium is very short and easily overlooked; the dactylus is a little longer than the propodus and bears a short curved terminal claw; all the segments of the limb are setose, especially on the inner surface.

The remaining legs are stout and subequal in length; the basis is about equal to the remaining segments together; the merus is slightly inflated and longer than the last three segments, which are very short; the dactylus is curved and ends in a strongly-curved claw.

The uropods have the peduncle less than twice as long as the last somite and about twice as long as the telson, thickened distally, where the diameter is about one-third of the length, minutely setose, and with a distal spine internally. The exopod is a little more than half as long as the peduncle and has a long and slender terminal spine. The endopod is one and a quarter times as long as the exopod, of two segments, the

distal a little longer than the proximal, with a slender terminal spine, one spinule on the inner edge of the first and two on the second segment.

Adult Male.—Total length 1.7 mm.

The dorsal outline of the carapace, seen from the side, is more evenly arched than in the female, not sloping in front, where the dorsal surface is convex from side to side and projects above the dorso-lateral crests. The pseudorostrum is a little more obtuse than in the female, and its upper edge slopes downwards. The ocular lobe is more prominent. The crests of the carapace and of the leg-bearing somites are disposed as in the female.

The antennæ reach only to the hinder edge of the carapace, by which, in the natural position, they are wholly concealed.

The third maxilliped has a well-developed exopod. The first legs are a little shorter than in the female. All the legs, except the last pair, have exopods.

The uropods are relatively a little longer than in the female, the difference in length of the rami is less, and their terminal spines are longer; the inner edge of the endopod has two spinules on the proximal segment and three on the distal.

Remarks.—This species differs greatly in general appearance from the other members of the genus; the short and stout cephalothoracic region, the presence of only a single pair of ridges on the carapace, and the reduction of the interval between the second and third pairs of legs in the female are all well-marked distinctions.

Occurrence.—Gulf of Siam, "Koh Kam, 5–10 fathoms, 2/00," "Between Koh Mesan and Cape Liant, 5–8 fathoms, 7/2/00." Th. Mortensen Coll. Japan, "33° 10' N., 129° 18' E., 40 fathoms, 7/9/97, Suenson Coll." Copenhagen Museum. Co-types in British Museum.

PARADIASTYLIS LONGIPES Calm.

Paradiastylis longipes Calman, Cumacea of Siboga Expedition, p. 21, figs. 4 a–i (1905).

Occurrence.—Gulf of Siam, "Koh Kam, 5–10 fathoms, 2/00," "Between Koh Mesan and Cape Liant, 5–8 fathoms, 7/2/00." Th. Mortensen Coll. Copenhagen Museum and British Museum.

Genus COLUROSTYLIS, gen. nov.

Pleural plates of third and fourth free thoracic somites expanded backwards, third legs separated from second in adult female; telson very small, flattened, without spines; third maxillipeds with exopods in both sexes; third and fourth legs with vestigial exopods in female; two pairs of biramous pleopods in male; endopod of uropods of two segments.

Type-species *C. pseudocuma*, sp. n.

In addition to the form and size of the telson, the general form of the body in the

species described below is strongly suggestive of the genus *Pseudocuma*, and, in fact, almost the only character visible without dissection to forbid its inclusion in that genus is the segmented endopod of the uropods. An affinity with the Diastylidæ is suggested by a number of small characters, of which the chief are the segmented inner flagellum of the antennule, the modification of the antennular peduncle and of the telson in the male, the triarticulate antenna in the female, the distally expanded basis of the third maxilliped, and the biramous pleopods in the male. The sum of these characters, however, does not remove the impression that the resemblance to the Pseudocumidæ is more than superficial and that the distinction between that family and the Diastylidæ is of diminishing importance.

COLUROSTYLIS PSEUDOCUMA, sp. n. (Plate XXXVI. figs. 23-36.)

Description of adult Female.—Total length 2.1 mm. (larger specimens to 2.3 mm.).

Carapace about two-sevenths of total length; its vertical height two-thirds of its length; dorsal edge slightly curved. Pseudorostrum straight, acute, horizontal or slightly raised. Antennal notch obsolete, antero-lateral corner rounded. Surface of carapace marked with very shallow broad pits. The ocular lobe is shaped much as in *Pseudocuma longicornis*. The eye is without pigment in the specimens examined. The free thoracic somites are deeper than the carapace anteriorly, the pleural plates of the third curved backwards so as to separate the third pair of legs widely from the second. The abdomen is a little shorter than the cephalothoracic region. The telson is about two-thirds as long as the last somite, obtusely pointed posteriorly, carrying a very few minute setæ but without spines.

The antennules have the first segment of the peduncle longer than either the second or third; the outer flagellum is about equal to the last segment of the peduncle, of three segments, the terminal very small; the inner flagellum is about equal to the first segment of the outer, also composed of three segments, the first and third minute. The antennæ are distinctly divided into three segments, the first bearing two setæ, the second and third one each.

The mouth-parts resemble those of *Pseudocuma*. The mandible has about nine spines.

The third maxillipeds have the basis expanded at the distal end and slightly produced, bearing on its distal edge a series of about four plumose setæ.

First pair of legs broken off in all the specimens seen.

Second legs with the basis about three-fourths as long as the distal segments together; dactylus short, not twice as long as propodus.

Third and fourth pairs of legs with the basis shorter than the distal segments together, bearing near its base an exopod of two segments, not much less than half the length of the segment from which it springs. Last pair of legs not much shorter than the preceding pair.

The uropods have the peduncle more than twice as long as the last somite, with a single spinule at its distal inner corner; the rami are subequal, shorter than the peduncle. The exopod has a long terminal spine, with two short ones on either side of it. The endopod is composed of two segments, the proximal shorter than the distal, fringed with fine setæ on the inner edge, and with a terminal spine and three or four spinules on the distal part of the inner edge partly hidden among the setæ.

Adult Male.—Total length 2.7 mm.

Carapace nearly one-third of total length, its vertical height about half of its length. The free thoracic somites not so deep as in the female; second and third pairs of legs not separated. The penultimate thoracic somite has a marked median dorsal keel. The posterior corners of the last somite are slightly produced and acute. The telson is about three-fourths as long as the last abdominal somite; it is produced well beyond the anal valves, the post-anal part forming a tongue-shaped lobe, of which the outline is continued forwards by two ridges on the dorsal surface of the telson. Two small setæ spring from the under surface, close to the tip, and there are some very fine setæ below the lateral margins.

The antennules have the peduncle slightly increasing in diameter distally, the first segment almost as long as the other two together, the last segment as broad as it is long and bearing a dense tuft of sensory filaments; the outer flagellum is more than half as long as the peduncle and consists of four subequal segments; the inner flagellum is more than half as long as the outer and also consists of four segments, of which the first and last are very small. The antennæ are about as long as the body; the last two segments of the peduncle are indistinctly separated and the sensory setæ which they bear are small and few in number.

Both pairs of pleopods are biramous, the outer ramus in each case of two segments.

The uropods have the peduncle nearly three times as long as the last segment, with about nine spinules interspersed with minute setæ on the inner edge; the rami are less than two-thirds as long as the peduncle; the endopod has on the inner edge six spinules on the first segment and seven on the second, with very minute setæ between.

Occurrence.—New Zealand, "Lyttleton Harbour, 1–5 fathoms, 8/97," "Akaroa Harbour, 6 fathoms, 8/97." H. Suter Coll., Copenhagen Museum. Co-types in British Museum.

Genus DIASTYLOPSIS S. I. Smith.

The two species described below conform in general characters to Zimmer's redefinition of this genus (*Cumaceen der Deutschen Tiefsee-Exp.* p. 189, 1908), except in having a very inconspicuous antennal notch. This character, combined with the elongated and perfectly smooth carapace, without teeth or ridges on the surface, suffices to distinguish them from all the species referred to the genus.

DIASTYLOPSIS ELONGATA, sp. n. (Plate XXXVII. figs. 1-12.)

Description of adult Female.—Total length 9.2 mm.

Carapace a little more than one-fourth of total length, compressed, its vertical height less than half its length; dorsal edge very slightly arched. Pseudorostrum straight, acute, slightly raised so as to form a very obtuse angle with the dorsal edge, about one-fifth of total length of carapace. Antennal notch slightly marked. Antero-lateral corner rounded and rather coarsely serrated. Ocular lobe with a minute terminal tooth projecting above the dorsal outline of the carapace. No distinct eye. Surface of carapace smooth.

The five leg-bearing somites are all distinct; the second is much longer than the first; the third and fourth are strongly expanded backwards at the sides, and a wide interval is left between the second and third pairs of legs.

The abdomen is about as long as the cephalothoracic region, rather slender, the fifth somite about twice as long as deep; first somite with a prominent, backwardly-curved tooth in the middle of the sternal surface; fifth somite with the postero-lateral angles spiniform.

Telson a little shorter than the last somite, its post-anal part much narrowed, the width at the level of the proximal pair of lateral spines being about one-eighth of its length; there are about eight pairs of short lateral spines, occupying about two-fifths of the lateral edge; the terminal spines are short.

Antennules with the first segment of the peduncle stout, expanding distally, shorter than the other two together; the second much stouter than, and more than half as long as, the third; the outer flagellum composed of three and the inner of two segments, with perhaps a minute terminal segment in each case.

The antenna is composed of three segments.

The mouth-parts are of normal type. The mandible has an elongated body and about twelve spines on the inner edge. The palp of the maxillula is bisetose. The basis of the third maxilliped is twice as long as the distal segments together, hardly expanded distally, carrying a well-developed exopod.

The first legs extend beyond the tip of the pseudorostrum by little more than the terminal segment; the basis is longer, by more than one-third, than the distal segments together, and has a row of denticles on its lower surface and a tooth at its distal inner corner; the carpus and propodus are subequal, and each a little longer than the dactylus.

The second legs have the basis a little less than one-third longer than the distal segments together, with a small tooth at its distal inner corner; the ischium and merus have the inner edge produced distally as a slight tooth; the merus is two-thirds as long as the carpus and a little shorter than the propodus and dactylus together.

The third and fourth pairs of legs have minute exopods, each of two segments. The coxa of the third pair is broadened in an antero-posterior direction, its distal edge is serrated, and the basis is attached near its posterior end; the basis has a small tooth on the anterior side at its distal end. The fifth pair of legs are much shorter than the fourth.

The peduncle of the uropods is a little more than half as long again as the telson, and has about seven spines on the distal part of its inner edge; the subequal rami are a little longer than two-thirds of the peduncle. The endopod is distinctly divided into three segments, the first longer than the other two together; there are numerous short spines on the inner edge, and the apical spine is short. The exopod bears setæ terminally and on the outer edge.

Adult Male.—Total length 9 mm.

The dorsal edge of the carapace is nearly straight and the pseudorostrum is horizontal. The ocular lobe is slightly prominent on the dorsal surface as seen from the side, but has no terminal tooth. The third and fourth leg-bearing somites are less strongly produced backwards than in the female, and there is no marked interval between the second and third pairs of legs. The last thoracic somite has the posterolateral corners produced as short spines. The ventral spine of the first abdominal somite is bifid. The telson, which has the usual dorsal prominence, is about as long as the last somite.

The peduncle of the antennules has the terminal segment stouter than in the female, and carrying a tuft of sensory filaments; the outer flagellum has five and the inner three segments, apart from a doubtful terminal segment in each case.

The antennæ have the usual structure; the sensory filaments on the anterior surface of the peduncle are very short; the flagellum, broken in the specimen figured, appears to be as long as the body.

The second legs have the distal segments more elongated than in the female, together hardly shorter than the basis; the carpus is nearly twice as long as the merus; the propodus is stouter and longer than the dactylus, and the latter bears terminally two small curved claws, which are absent in the female. In the third and fourth pairs of legs the basis is produced into a strong tooth at its distal end anteriorly. In the fourth and fifth pairs (but not in the third) the ischium is produced posteriorly in a tooth-like process.

Both pairs of pleopods are biramous, with the exopod of two segments.

The exopod of the uropods is slightly shorter than the endopod; there are numerous spinules on the inner edge of the latter and of the peduncle.

Occurrence.—New Zealand, "Lyttleton Harbour, 1–5 fathoms, H. Suter Coll., 8/97," "Akaroa Harbour, H. Suter." Copenhagen Museum. Co-types in British Museum.

DIASTYLOPSIS CRASSIOR, sp. n. (Plate XXXVII. figs. 13-18.)

Description of adult Female.—Total length 9.25 mm.

Closely resembling *D. elongata*. The slightly curved dorsal outline of the carapace is continued without a break by the upper edge of the pseudorostrum. The ocular lobe is not prominent dorsally, and has no tooth. The pseudorostrum is less acutely pointed than in *D. elongata*.

Abdominal somites much stouter than in *D. elongata*, the fifth somite less than one and a half times as long as deep. First somite without any median tooth on the ventral side (only in one specimen a minute median denticle was observed), but with two ventro-lateral rows of denticles. Postero-lateral angles of third, fourth, and fifth somites spiniform.

Telson much less narrowed distally than in *D. elongata*, its width at the level of the proximal pair of spines nearly one-fourth of its length; there are seven or eight spines on each side and the terminal spines are short.

The antennules are relatively a little longer than in *D. elongata*. The mouth-parts show no differences of importance.

The first legs have the spines on the lower surface of the basis stronger and more numerous than in *D. elongata*. The basis of the second legs is little shorter than the distal segments together and has some teeth on its lower surface and outer edge and a strong tooth at its distal inner corner; the ischium is produced on the inner side into two and the merus into three strong teeth; the merus is a little more than half as long as the carpus, and equal to the propodus and dactylus together.

The succeeding pairs of legs are stouter and longer than in *D. elongata*. The tooth at the distal end of the basis in the third and fourth is strong and, in some cases, bifid.

The peduncle of the uropods is twice as long as the telson and has six spines, much longer than those of *D. elongata*, on its inner edge; the exopod is distinctly longer than the endopod, which is about two-thirds as long as the peduncle; the spines on the inner edge of the peduncle are longer than in *D. elongata*.

Remarks.—This species is very closely allied to, but I believe distinct from, *D. elongata*, in company with which it occurred. It differs from that species in the stouter abdomen (which is very conspicuous when specimens of similar size are compared), in the very different spinous armature on the under side of the first abdominal somite, in the form of the telson, and in the stronger spines on the legs, especially on the second pair.

Occurrence.—New Zealand, "Lyttleton Harbour, 1-5 fathoms, H. Suter Coll., 8/97." Copenhagen Museum. Co-types in British Museum.

Genus *DIASTYLIS*.

The genus *Diastylis*, as it stands at present, is hardly more than a convenient receptacle for unclassified Diastylidæ, and this alone can excuse the temporary assignment to it of the remarkable form here described from immature specimens as *Diastylis* (?) *fistularis*. The other new species is a typical *Diastylis*, or, rather, it belongs to the group which we may assume to be typical until Say's *D. arenaria* is rediscovered.

DIASTYLIS KOREANA, sp. n. (Plate XXXVII. figs. 19-25.)

Description of adult Female.—Total length 12 mm.

Carapace about one-third of total length, its vertical height a little less than half its length, widest behind, where the width is about two-thirds of its length; dorsal surface arched, slightly uneven in front and with a median depression posteriorly between the branchial regions; the whole surface beset with setæ, among which are minute spiniform points, most conspicuous on the anterior part of the dorsal surface. Pseudorostrum slender, slightly curved as seen from the side, nearly one-third of total length of carapace. Antennal notch obsolete, lower margin minutely dentate anteriorly. Ocular lobe very small or absent; no distinct eye.

The free thoracic somites are rather less thickly setose than the carapace; the last thoracic somite has the posterior corners not produced, rounded, with a minute terminal spinule.

The abdomen is about as long as the cephalothoracic region; the first five somites have the lateral corners produced and spiniform, and each bears a pair of small dorso-lateral teeth.

The telson is as long as the last two somites together; the post-anal part is a little shorter and much narrower than the pre-anal, and bears on each side about ten long, slender, almost setiform, lateral spines; the terminal spines are a little stouter and, like the lateral spines, curved upwards.

The antennules are rather slender and the peduncle reaches to the tip of the pseudorostrum; the first and third segments are subequal and longer than the second; the flagella were imperfect in all the adult specimens examined.

The first legs extend beyond the pseudorostrum by the length of their two distal segments; the basis is two-thirds as long as the distal segments together, and carries numerous long plumose hairs; there are a few small teeth on its lower surface; the propodus is longer than the carpus and nearly twice as long as the dactylus.

The second legs have the basis a little shorter than the distal segments together, carrying long plumose setæ; the carpus is longer by one-half than the propodus and dactylus together.

The last three pairs of legs are stout, with numerous strong setæ on the distal

segments; the merus is produced distally on the outer or posterior side of its articulation with the carpus into a rounded tubercle.

The uropods are slender, the peduncle about as long as the telson, with about twelve spinules on the inner edge. The exopod is shorter than the endopod, and curved. The endopod is about half as long as the peduncle, distinctly divided into three segments, of which the first is longer than the other two together; the inner edge has about eleven spinules, and the short terminal spine is distinctly defined.

Remarks.—The hairiness of the carapace gives this species some resemblance to *D. goodsiri**, which it further resembles in the acutely produced lateral angles of the abdominal somites and in the length and slenderness of the lateral spines on the telson. It differs in the form of the carapace, which is narrowed in front, in the great length of the pseudorostrum, and in the proportions of the telson. The knob-like prominence on the merus of the last three pairs of legs appears also to be a distinctive character.

Occurrence.—"Korea, 35 fathoms, Suenson Coll., 22/1/82." Copenhagen Museum. Co-types in British Museum.

DIASTYLIS (?) FISTULARIS, sp. n. (Plate XXXVII. figs. 26-36.)

Description of young Specimen (? Male).—Total length 3.1 mm.

Carapace about one-third of total length, its vertical height about one-half of its length, subcylindrical, abruptly narrowed in front as seen from above; dorsal surface slightly arched, rather flattened anteriorly. Pseudorostrum straight, acutely pointed. Antennal notch hardly indicated. Posteriorly the surface of the carapace bears four longitudinal ridges on each side; anteriorly on each side is a vertical ridge forming a marked "shoulder" when viewed from above; from the upper end of the vertical ridge an obliquely longitudinal ridge runs backwards and curves towards the median line about the middle of the dorsal surface. The ocular lobe is a little broader than long and is without pigment or definite corneal facets.

The first free thoracic somite is partly concealed laterally; the third and fourth are not distinctly separated on the dorsal surface.

The abdomen, including the telson, is longer by one-third than the cephalothoracic region; the fifth somite is hardly longer than the preceding; the sixth is longer than the fifth, somewhat flattened, hardly longer than broad, with the uropods articulated about the middle of its length.

The telson is about as long as the last four somites together, and two-thirds their thickness. It is cylindrical in form, with a slight dorsal curvature, and bluntly pointed

* Sars states (Crust. Norway, iii. p. 54) that in *D. goodsiri* the surface of the carapace is "without any spines or denticles." Hansen, on the other hand, describes it as "tact besat med meget fine skarpe og spidse Kegler." A fine specimen, received from the Copenhagen Museum, agrees with Dr. Hansen's description in this respect.

at the tip. The anus is terminal and the anal valves are placed as in *D. tubulicauda*, although they are not so well marked as in that species. The apex of the telson on the dorsal side of the anus is without spines and has only a single lateral pair of fine setæ.

The antennules are about three-fourths as long as the carapace; the first segment of the peduncle is a little longer than either of the other two; the outer flagellum is more than one-third of the length of the peduncle and more than twice as long as the inner.

The antennæ have a large fusiform terminal segment which may possibly represent the developing flagellum of the male sex.

The mouth-parts appear to present no noteworthy divergences from the usual type. The branchial plates have about four lobules and others in course of development.

The third maxillipeds have small exopods, without setæ, and obscurely divided into two segments; the basis is greatly expanded distally and is produced into a broad lobe which reaches nearly to the end of the carpus.

The first legs are long and slender, about half of the carpus extending beyond the pseudorostrum; the basis is a little less than half as long as the distal segments together; the carpus is a little shorter than the propodus, which is nearly three times as long as the dactylus.

The second legs have the basis narrowed distally, a little shorter than the distal segments together, the carpus about equal to the dactylus and three times as long as the propodus.

The third and fourth pairs of legs are long and stout. Each bears an exopod, about one-third of the length of the basis, indistinctly divided into two segments, and carrying a single terminal seta. The fifth pair of legs are only two-thirds as long as the preceding pair, without exopods, and with fewer setæ.

The uropods hardly extend beyond three-fourths of the length of the telson; the peduncle has three minute setæ on the distal part of its inner edge. The exopod is a very little longer than the endopod and more than half the length of the peduncle; its apical setæ are long and slender. The endopod has three segments, the first occupying more than half its length, with four small spines on the inner edge and a slender terminal spine.

In a specimen 1.7 mm. in total length the last thoracic somite is still without appendages, the endopod of the uropods consists of only two segments, and the exopods on the third and fourth pairs of legs and on the third maxillipeds are extremely small.

A specimen of which the total length cannot have been less than 6 mm. is unfortunately represented only by the abdomen and the posterior thoracic somites. It has no exopods on the third and fourth pairs of legs.

Remarks.—In the great size and tubular form of the telson this species resembles *D. tubulicauda* Calman (Cumacea, in Fisheries, Ireland, Sci. Invest. 1904, i. (1905)

p. 46, pl. v. figs. 82-86). The unique type-specimen of that species, like the two smaller of the specimens described above, has minute exopods on the third and fourth pairs of legs, and, like the smallest, is without appendages on the last thoracic somite; on the other hand, it possesses a well-developed exopod on the third maxilliped where the present specimens have only a rudiment. The new species further differs in having no apical spines on the telson, a character in which it approaches *Pachystylis rotundata* of Hansen.

Only the discovery of adult specimens will allow the generic position to be decided, but the characters of the form here described are so striking that there can be little difficulty in recognising the species again.

Occurrence.—Gulf of Siam, "Between Koh Mesan and Cape Liant, 9 fathoms," "Koh Kam, 10 fathoms," "Koh Chuen, 30 fathoms." Th. Mortensen Coll., Copenhagen Museum. Co-type in British Museum.

DIASTYLIS INSULARUM Calm.

Leptostylis (?) *insularum*, Calman, Ann. Mag. Nat. Hist. (8) i. p. 234, figs. 1-5 *a* (1908).

Occurrence.—"Lyttleton Harbour, New Zealand, 1-5° fathoms, 8/97. H. Suter Coll." Copenhagen Museum and British Museum.

PLATE XXXII.

PLATE XXXII.

- Fig. 1. *Cumella forficula* (p. 345). Female. From the side.
 2. „ „ „ „ From above.
 3. „ „ „ „ Fifth leg.
 4. „ „ „ „ Last somite and uropods.
 5. „ „ „ Male. From the side (appendages omitted).
 6. „ „ „ „ Last somite and uropods.
 7. *Cumella clavicauda* (p. 346). Male. From the side (appendages omitted).
 8. „ „ „ „ From above.
 9. „ „ „ „ Fifth leg.
 10. „ „ „ „ Last somite and uropod.
 11. *Cumella leptopus* (p. 347). Male. From the side.
 12. „ „ „ „ From above.
 13. „ „ „ „ Fifth leg.
 14. „ „ „ „ Last somite and uropod.
 15. *Cumella hispida* (p. 347). Female. From the side (appendages omitted).
 16. „ „ „ „ From above.
 17. „ „ „ „ Fifth leg.
 18. „ „ „ „ Last somite and uropod.
 19. *Cumella serrata* (p. 348). Female. From the side.
 20. „ „ „ „ First leg.
 21. „ „ „ „ Fifth leg.
 22. „ „ „ „ Last somite and uropod.
 23. „ „ „ Male. From the side.
 24. „ „ „ „ Last somite and uropod.
 25. *Cumella lavis* (p. 350). Female. From the side (appendages omitted).
 26. „ „ „ „ Fifth leg.
 27. „ „ „ „ Last somite and uropod.



1-6. CUMELLA FORFICULA.

7-10. C. CLAVICAUDA.

11-14. C. LEPTOPUS.

15-18. C. HISPIDA.

19-24. C. SERRATA.

25-27. C. LAEVIS.

PLATE XXXIII.

PLATE XXXIII.

- | | | | |
|---------|---------------------------------------|---------|---|
| Fig. 1. | <i>Nannastacus lepturus</i> (p. 352). | Male. | From the side. |
| 2. | " " | " | Fifth leg. |
| 3. | " " | " | Last somite and uropod. |
| 4. | <i>Nannastacus zimmeri</i> (p. 352). | Female. | From the side. |
| 5. | " " | " | From above. |
| 6. | " " | " | Third maxilliped. |
| 7. | " " | " | Last somite and uropods. |
| 8. | " " | Male. | From the side. |
| 9. | " " | " | From above. |
| 10. | " " | " | Antero-lateral part of carapace. |
| 11. | " " | " | Antennule. |
| 12. | " " | " | Third maxilliped. |
| 13. | " " | " | First leg. |
| 14. | " " | " | Fifth leg. |
| 15. | " " | " | Last somite and uropods. |
| 16. | <i>Nannastacus gibbosus</i> (p. 355). | Female. | From the side. |
| 17. | " " | " | Outline of cephalothoracic region
from another specimen. |
| 18. | " " | " | From above. |
| 19. | " " | " | Third maxilliped. |
| 20. | " " | " | Fifth leg. |
| 21. | " " | " | Last somite and uropod. |
| 22. | <i>Nannastacus reptans</i> (p. 356). | Female. | From the side. |
| 23. | " " | " | From above. |
| 24. | " " | " | Third maxilliped. |
| 25. | " " | " | First leg. |
| 26. | " " | " | Second leg. |
| 27. | " " | " | Fifth leg. |
| 28. | " " | " | Last somite and uropod. |



1-3. *NANNASTACUS LEPTURUS*. 4-15. *N. ZIMMERI*.

16-21. *N. GIBBOSUS*. 22-28. *N. REPTANS*.

PLATE XXXIV.

Fig. 1.	<i>Nannastacus minor</i> (p. 357).	Female.	From the side.
2.	„ „	„	First leg.
3.	„ „	„	Second leg.
4.	<i>Nannastacus tardus</i> (p. 359).	Female.	From the side.
5.	„ „	„	From above.
6.	„ „	„	Antennule.
7.	„ „	„	Third maxilliped.
8.	„ „	„	First leg.
9.	„ „	„	Second leg.
10.	„ „	„	Fifth leg.
11.	„ „	„	Last somite and uropod.
12.	<i>Nannastacus agnatus</i> (p. 360).	Female.	First leg.
13.	„ „	„	Second leg.
14.	<i>Schizotrema depressum</i> (p. 361).	Female.	From the side.
15.	„ „	„	From above.
16.	„ „	„	Second leg.
17.	„ „	„	Fifth leg.
18.	<i>Schizotrema bifrons</i> (p. 362).	Female.	From the side.
19.	„ „	„	From above.
20.	„ „	„	Fifth leg.
21.	„ „	„	Last somite and uropods.
22.	<i>Schizotrema sordidum</i> (p. 363).	Female.	From the side.
23.	„ „	„	From above.
24.	„ „	„	Fifth leg.
25.	<i>Canpylaspis platyuropus</i> (p. 364).	Female.	From the side (appendages omitted).
26.	„ „	„	Third maxilliped (exopod omitted).
27.	„ „	„	First leg.
28.	„ „	„	Last somite and uropod, from above.
29.	„ „	„	Uropod, from the side.



W.T.C. Gavin, del.

With 30 figures.

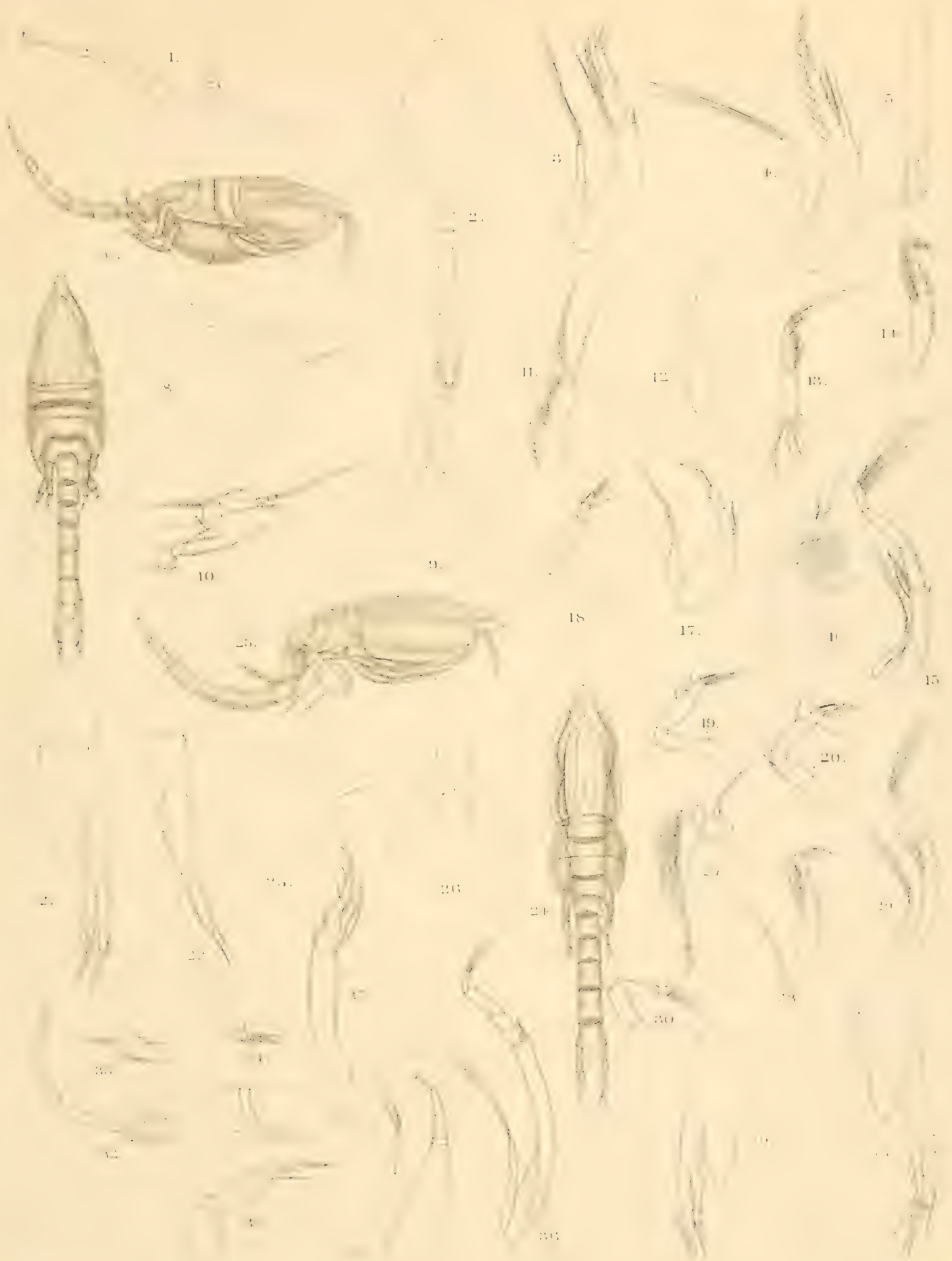
1-3. *NANNASTACUS MINOR*. 4-11. *N. TARDUS*. 12-13. *N. AGNATUS*.

14-17. *SCHIZOTREMA DEPRESSUM*. 18-21. *S. BIFRONS*.

22-24. *S. SORDIDUM*. 25-29. *CAMPYLASPIS PLATYUROPIUS*.

PLATE XXXV.

Fig. 1.	<i>Campylaspis orientalis</i> (p. 365).	Female.	From the side (appendages omitted).
2.	"	"	From above.
3.	"	"	Third maxilliped.
4.	"	"	First leg.
5.	"	"	Uropod.
6.	<i>Gynodiastylis carinata</i> (p. 368).	Female.	From the side.
7.	"	"	From above. [side
8.	"	"	Anterior part of carapace, from the
9.	"	"	" " from above.
10.	"	"	Antennule and antenna.
11.	"	"	First maxilliped.
12.	"	"	Branchial apparatus.
13.	"	"	Second maxilliped.
14.	"	"	Third maxilliped.
15.	"	"	First leg.
16.	"	"	Distal segments of same, further
17.	"	"	Second leg. [enlarged.
18.	"	"	Third leg.
19.	"	"	Fourth leg.
20.	"	"	Fifth leg. [from above.
21.	"	"	Last somite, telson, and uropod,
22.	"	"	" " " " "
23.	"	Male.	From the side. [from side.
24.	"	"	From above.
25.	"	"	Anterior part of carapace, from the side.
26.	"	"	" " from above.
27.	"	"	Antenna.
28.	"	"	Third maxilliped.
29.	"	"	First leg.
30.	"	"	Third leg.
31.	"	"	Last somite, telson, and uropod.
32.	<i>Gynodiastylis lævis</i> (p. 371).	Female.	From the side.
33.	"	"	Antennule.
34.	"	"	Antenna.
35.	"	"	Third maxilliped.
36.	"	"	First leg.
37.	"	"	Second leg.
38.	"	"	Fifth leg.
39.	"	"	Last somite, telson, and uropod.



W.T. Coleman, del.

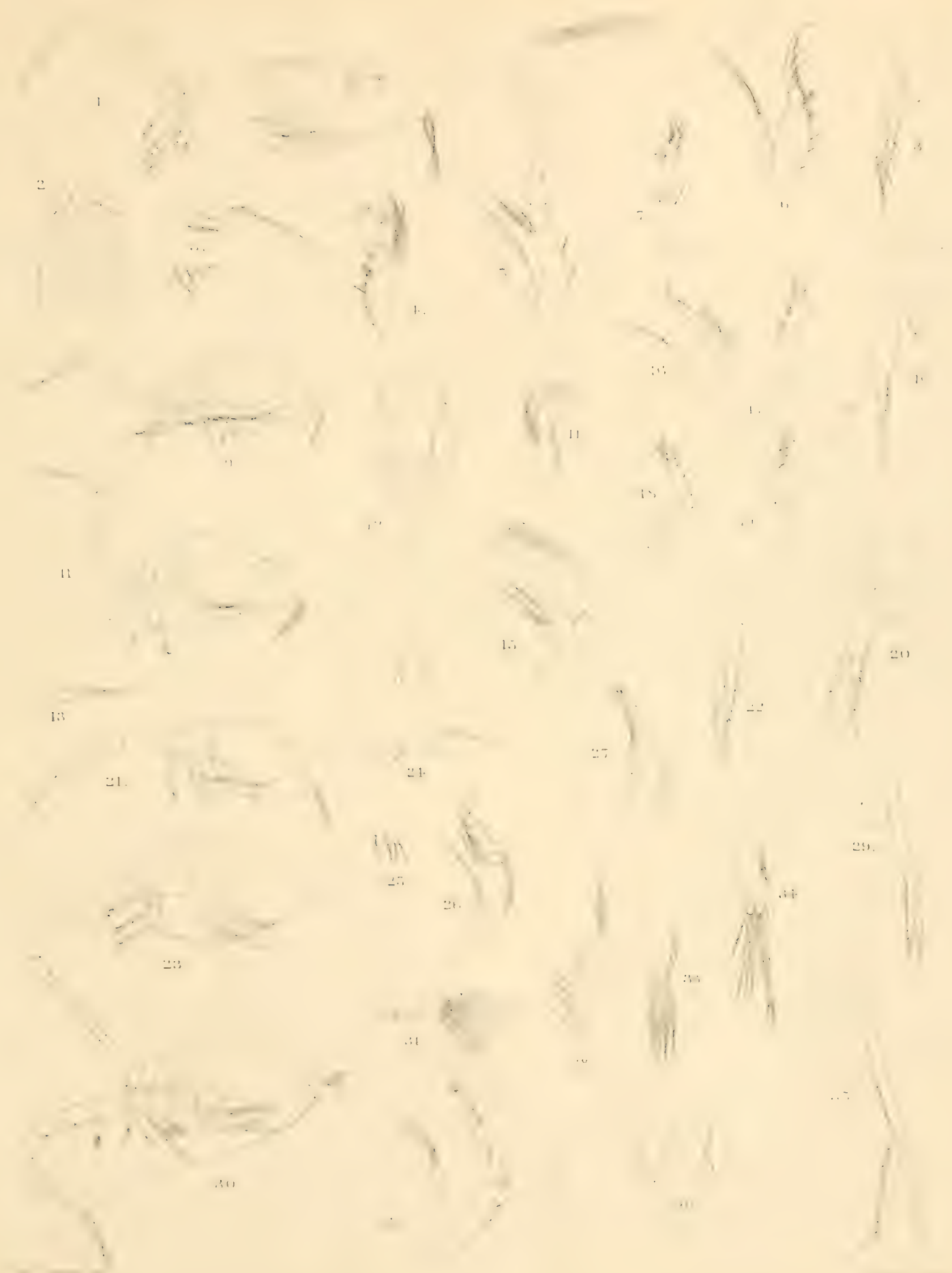
1—5. *CAMPYLASPIS ORIENTALIS*.

6—31. *GYNODIASTYLIS CARINATA*.

32—39. *LAEVIS*.

PLATE XXXVI.

Fig.	1.	<i>Gynodiastylis costata</i> (p. 372).	Female.	From the side.
	2.	" "	"	Carapace, from above.
	3.	" "	"	Antennule and antenna.
	4.	" "	"	Third maxilliped.
	5.	" "	"	First leg.
	6.	" "	"	Second leg.
	7.	" "	"	Fifth leg.
	8.	" "	"	Last somite, telson, and uropod.
	9.	" "	Male.	From the side.
	10.	" "	"	Last somite, telson, and uropod.
	11.	<i>Gynodiastylis bicristata</i> (p. 374).	Female.	From the side.
	12.	" "	"	From above.
	13.	" "	"	Antennule.
	14.	" "	"	Third maxilliped.
	15.	" "	"	First leg.
	16.	" "	"	Second leg.
	17.	" "	"	Third leg.
	18.	" "	"	Fourth leg.
	19.	" "	"	Fifth leg.
	20.	" "	"	Last somite, telson, and uropod.
	21.	" "	Male.	From the side.
	22.	" "	"	Uropod.
	23.	<i>Colurostylis pseudocuma</i> (p. 377).	Female.	From the side.
	24.	" "	"	Antennule.
	25.	" "	"	Antenna.
	26.	" "	"	Third maxilliped.
	27.	" "	"	Second leg.
	28.	" "	"	Third leg.
	29.	" "	"	Last somite, telson, and uropod.
	30.	" "	Male.	From the side.
	31.	" "	"	Antennule.
	32.	" "	"	Second leg.
	33.	" "	"	First pleopod.
	34.	" "	"	Second pleopod.
	35.	" "	"	Last somite, telson, and uropod.
	36.	" "	"	Apex of telson from above and from the side.

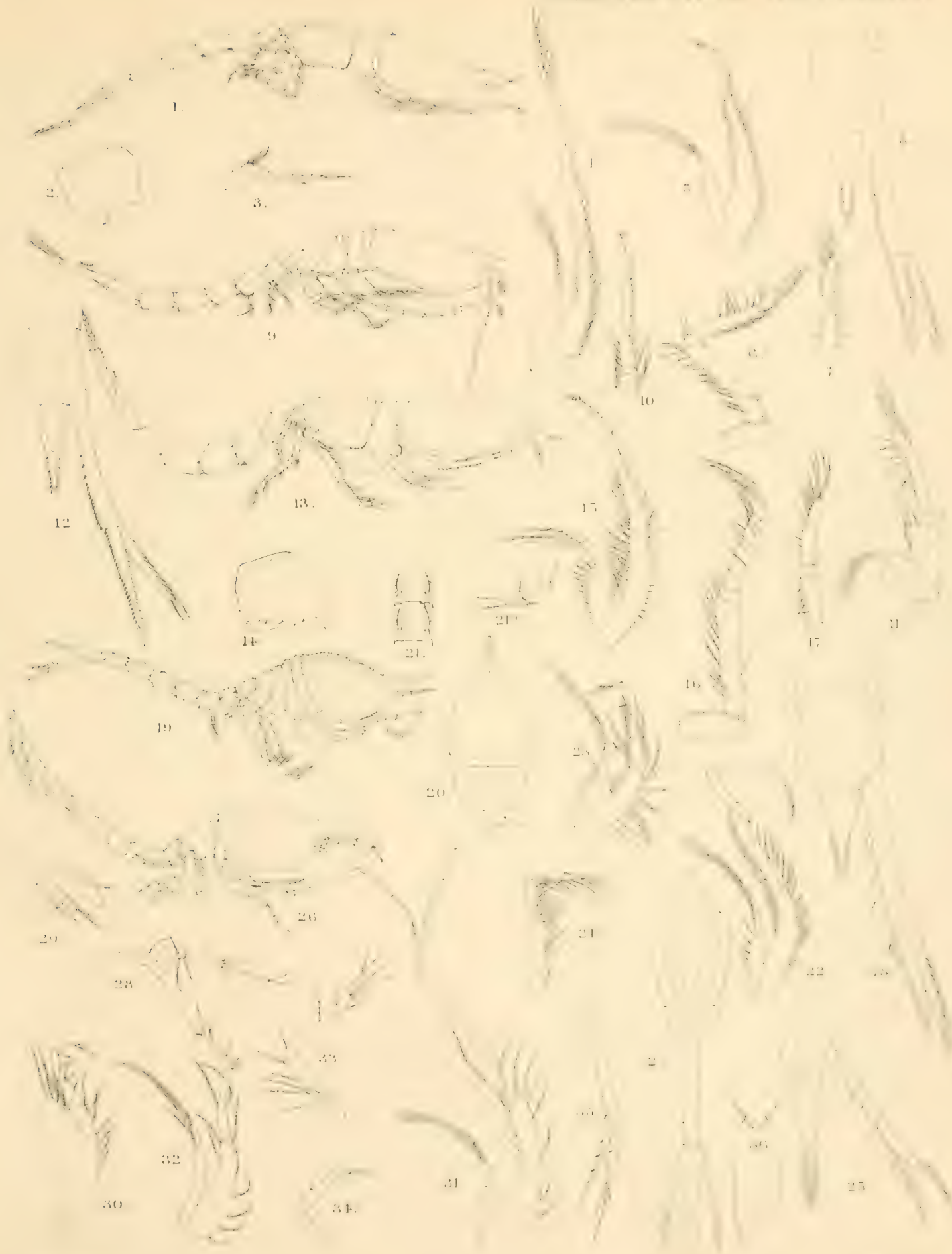


I—10. GYNODISTYLIS COSTATA. II—21. G. BICRISTATA.
22—36. COLUROSTYLIS PSEUDOCUMA.

PLATE XXXVII.

PLATE XXXVII.

- Fig. 1. *Diastylopsis elongata* (p. 379). Female. From the side.
- | | | | | |
|-------|--|---|-------|---|
| 2. | „ | „ | „ | First abdominal somite, from the side. |
| 3. | „ | „ | „ | Antennule. |
| 4. | „ | „ | „ | First leg. |
| 5. | „ | „ | „ | Second leg. |
| 6. | „ | „ | „ | Third leg. |
| 7. | „ | „ | „ | Fifth leg. |
| 8. | „ | „ | „ | Last somite, telson, and uropod. |
| 9. | „ | „ | Male. | From the side. |
| 10. | „ | „ | „ | Terminal part of second leg. |
| 11. | „ | „ | „ | Fourth leg. |
| 12. | „ | „ | „ | Last somite, telson, and uropod. |
| 13. | <i>Diastylopsis crassior</i> (p. 381). Female. From the side. | | | |
| 14. | „ | „ | „ | First abdominal somite, from the side. |
| 15. | „ | „ | „ | Second leg. |
| 16. | „ | „ | „ | Third leg. |
| 17. | „ | „ | „ | Fifth leg. |
| 18. | „ | „ | „ | Last somite, telson, and uropod. |
| 19. | <i>Diastylis koreana</i> (p. 382). Female. From the side. | | | |
| 20. | „ | „ | „ | Cephalothoracic region, from above. |
| 21. | „ | „ | „ | Third and fourth abdominal somites, from above. |
| 21 a. | „ | „ | „ | Antennule. |
| 22. | „ | „ | „ | First leg. |
| 23. | „ | „ | „ | Second leg. |
| 24. | „ | „ | „ | Fourth leg. |
| 25. | „ | „ | „ | Last somite, telson, and uropod. |
| 26. | <i>Diastylis fistularis</i> (p. 383). Young male (?). From the side. | | | |
| 27. | „ | „ | „ | From above. |
| 28. | „ | „ | „ | Antennule. |
| 29. | „ | „ | „ | Antenna. |
| 30. | „ | „ | „ | Third maxilliped. |
| 31. | „ | „ | „ | First leg. |
| 32. | „ | „ | „ | Second leg. |
| 33. | „ | „ | „ | Third leg. |
| 34. | „ | „ | „ | Fifth leg. |
| 35. | „ | „ | „ | Uropod. |
| 36. | „ | „ | „ | Apex of telson, from above and from the side. |



1—12. DIASTYLOPSIS ELONGATA. 13—18. D. CRASSIOR.
19—25. DIASTYLIS KOREANA. 26—36. D. FISTULARIS

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